

THE IRON AGE

A Review of the Hardware, Iron and Trades.

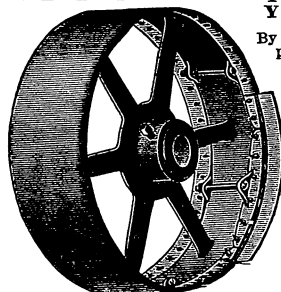
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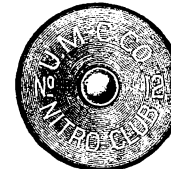
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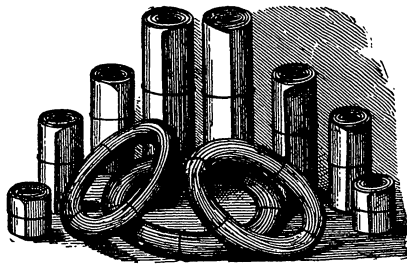
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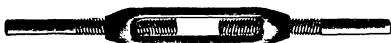
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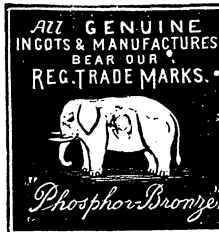
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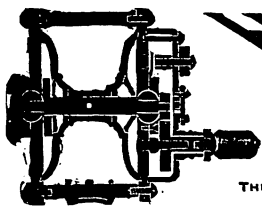
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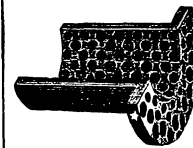
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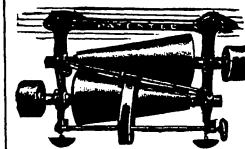
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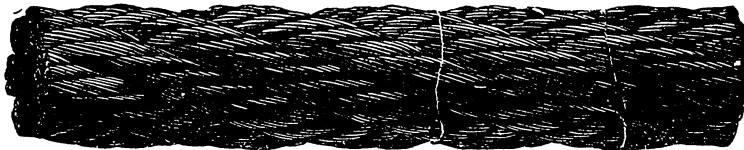
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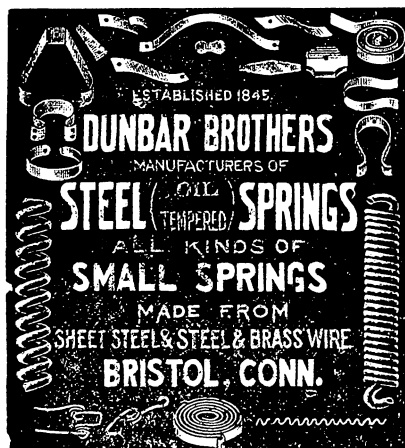
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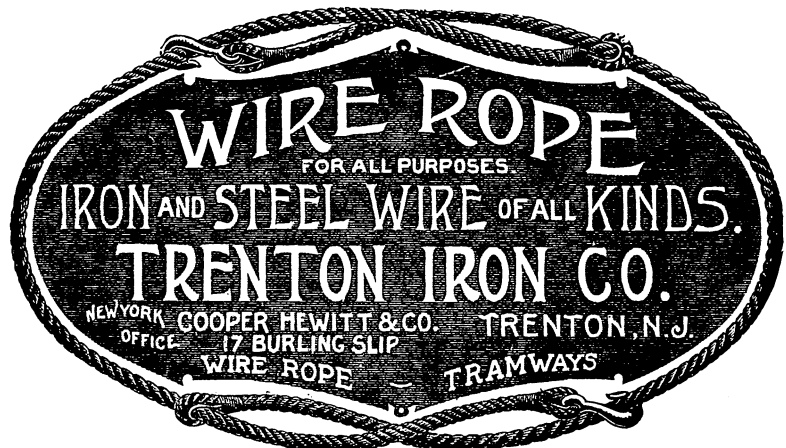
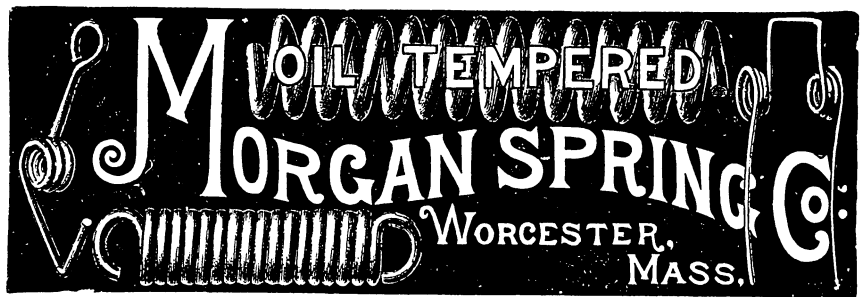
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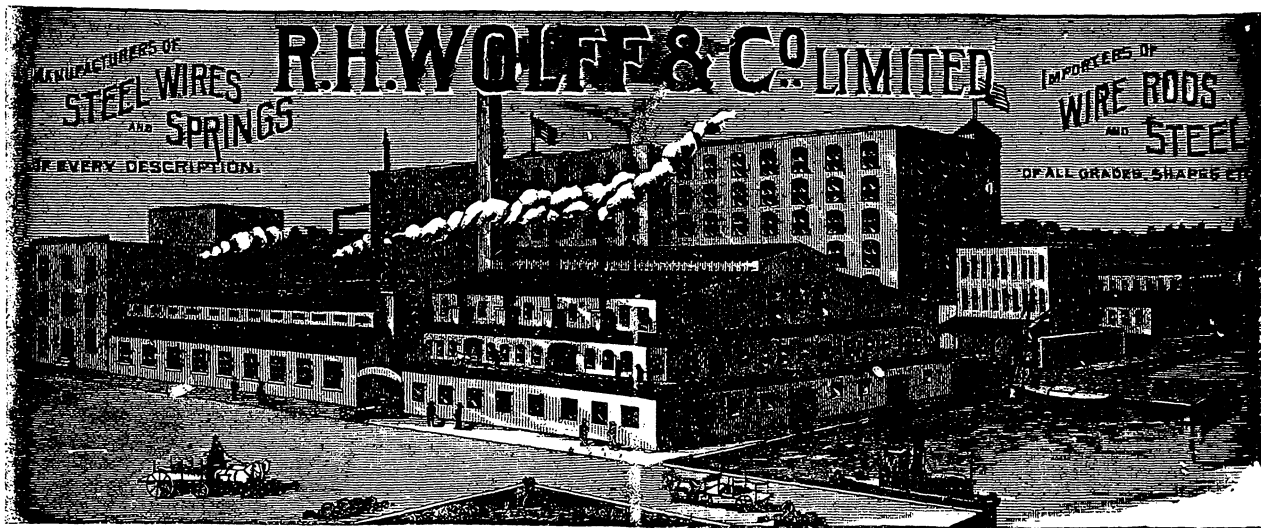
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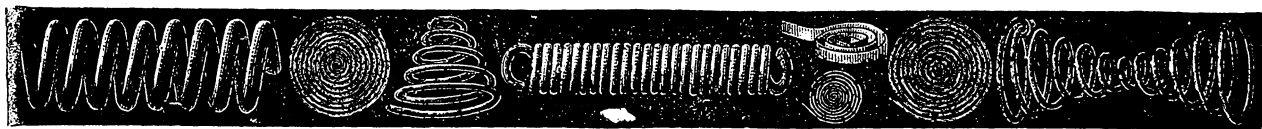
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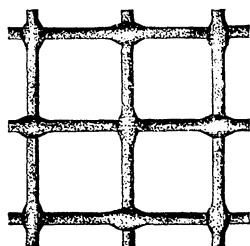
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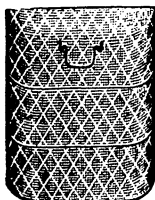
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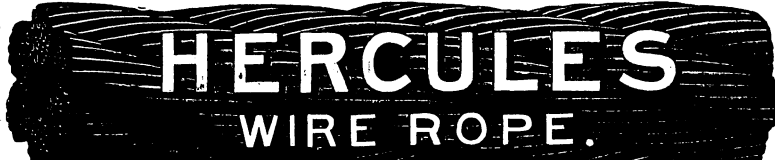
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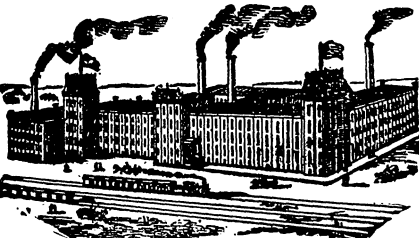
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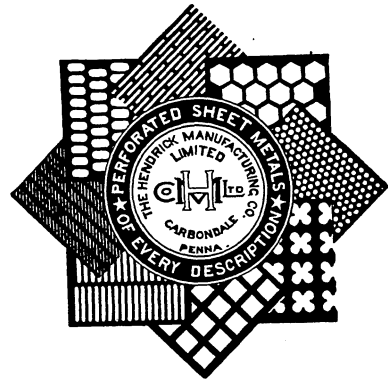
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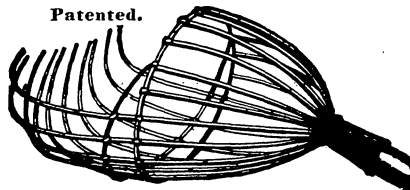
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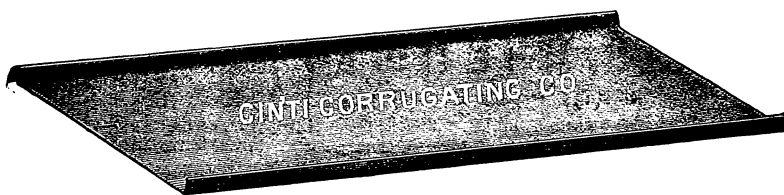
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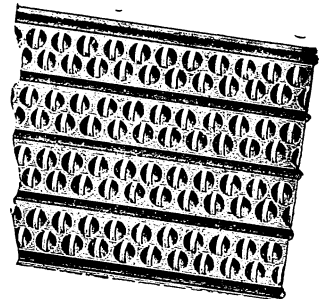
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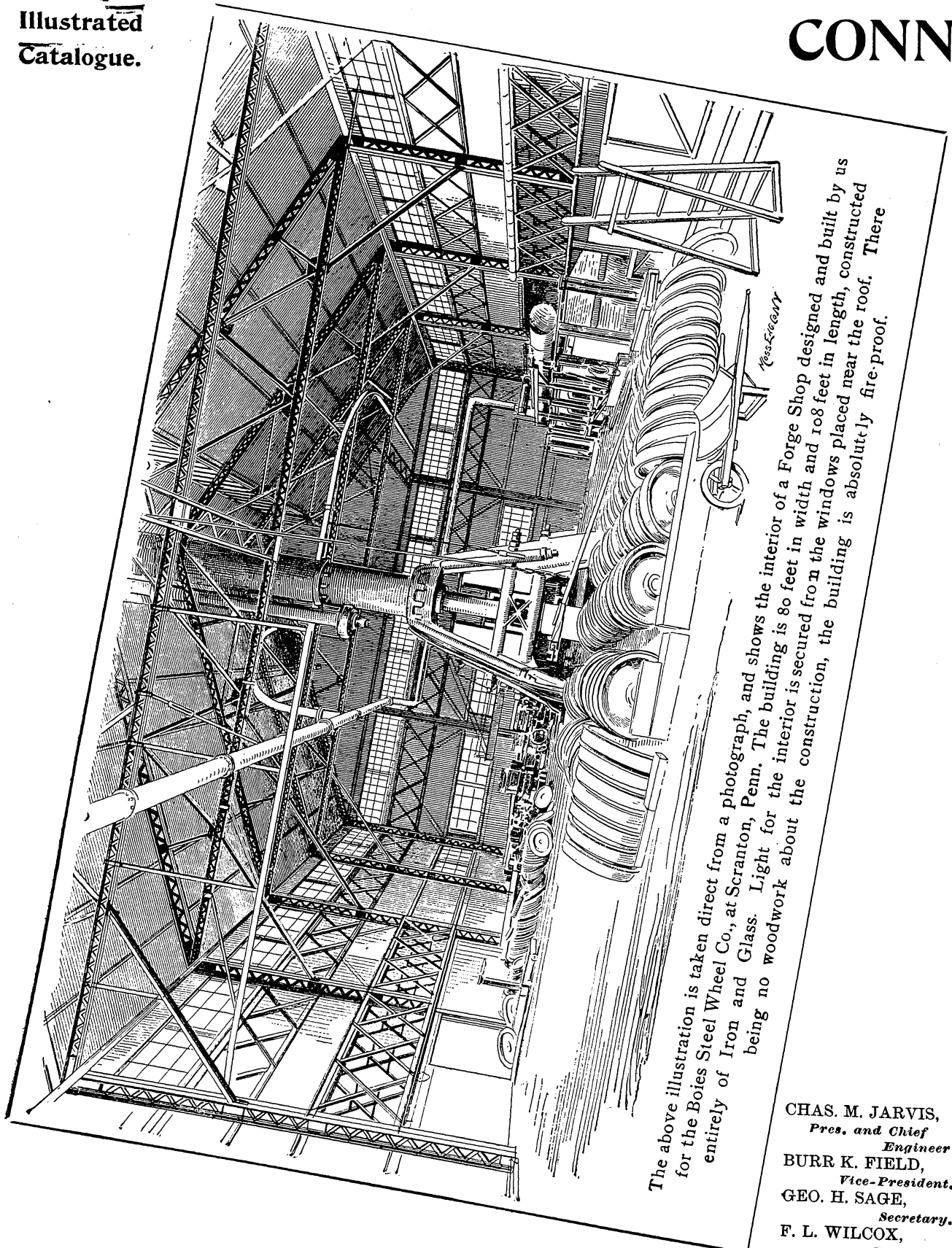
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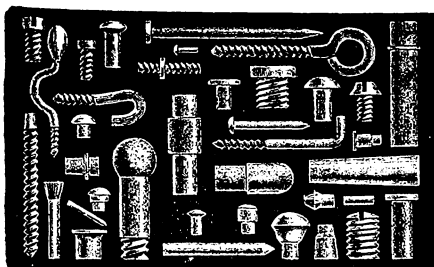
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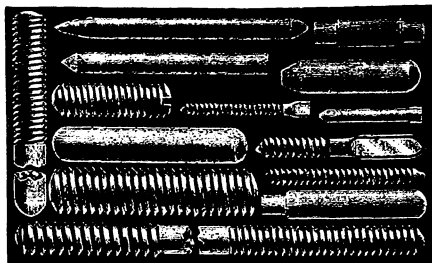


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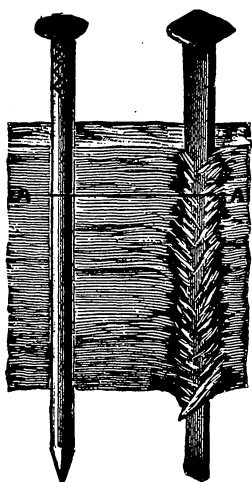
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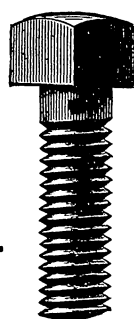
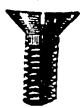
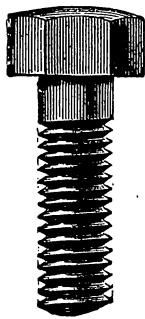


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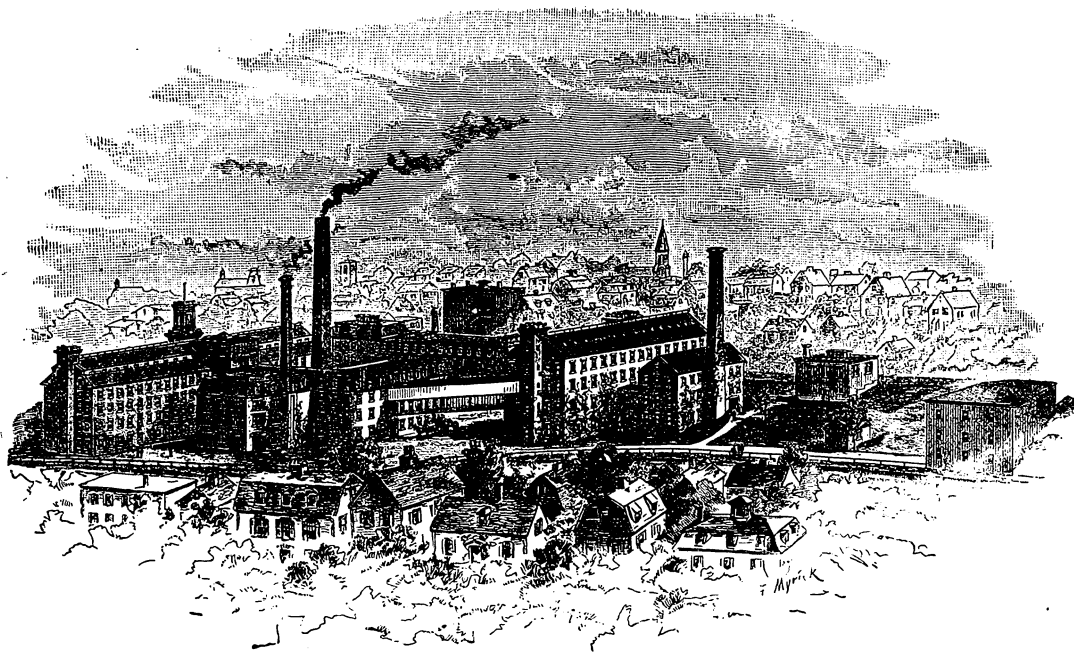
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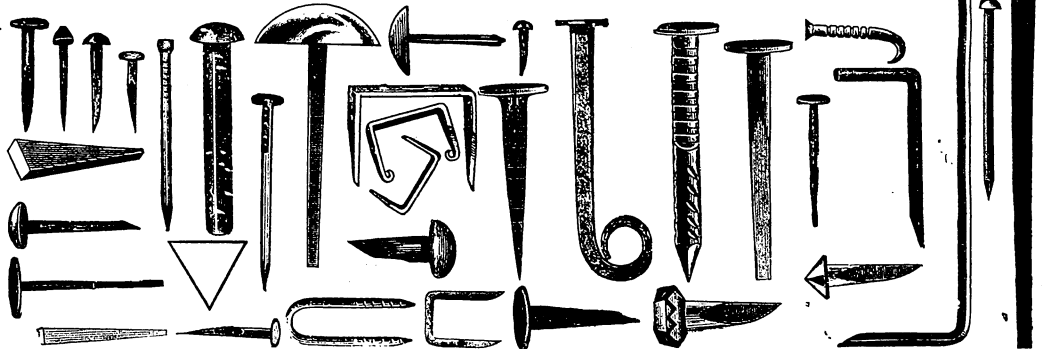
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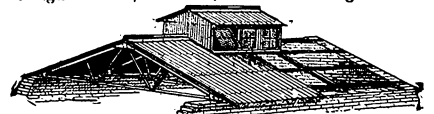
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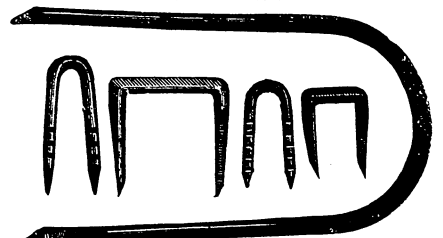


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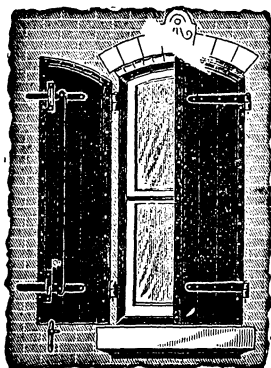
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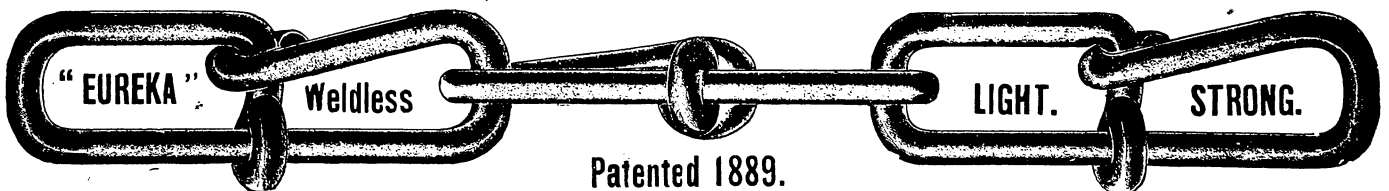
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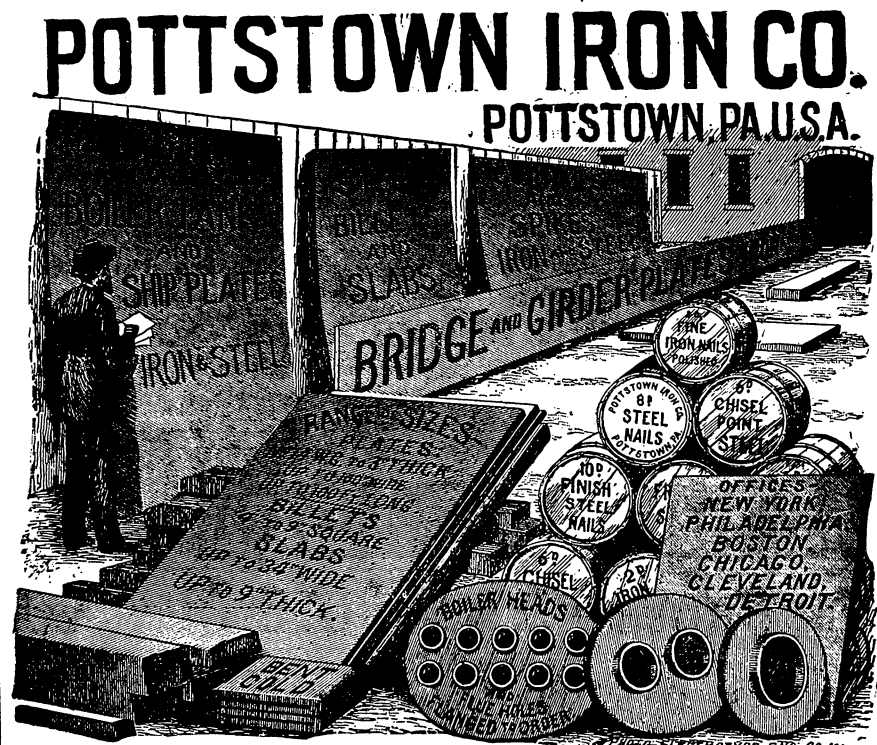


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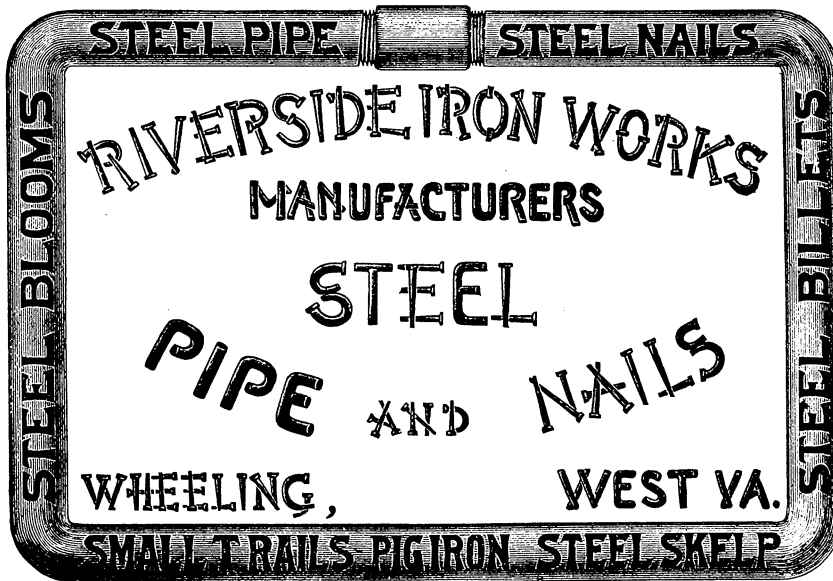
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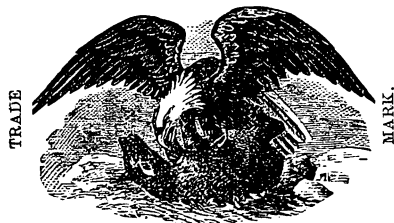
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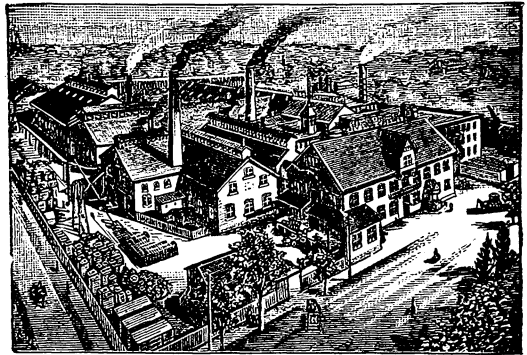
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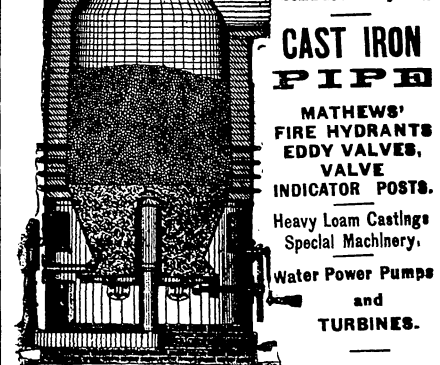
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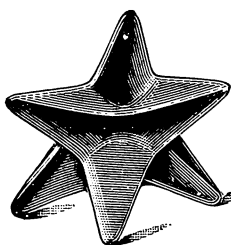
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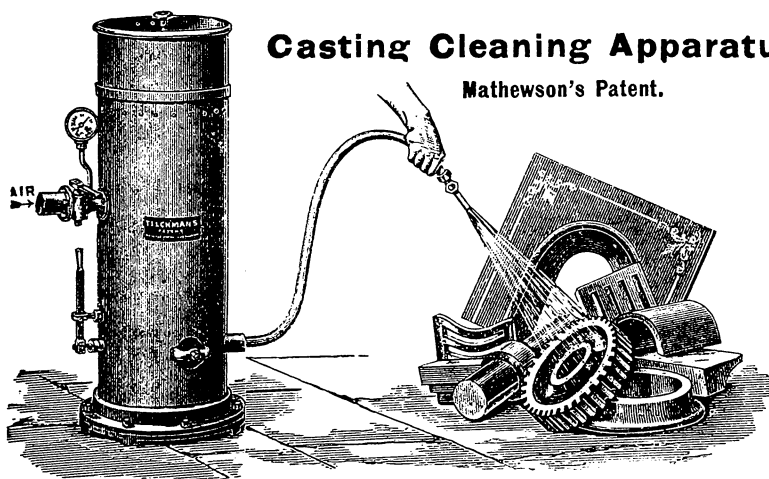
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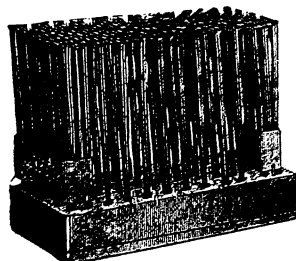
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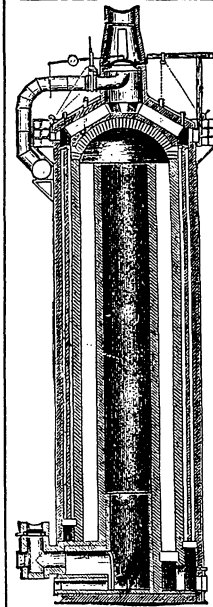
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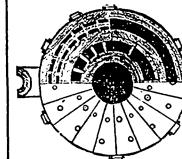
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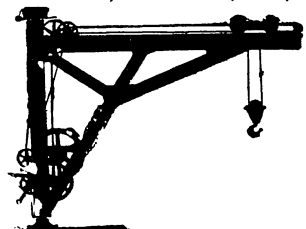
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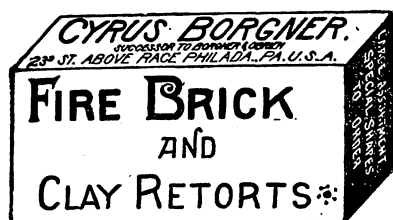
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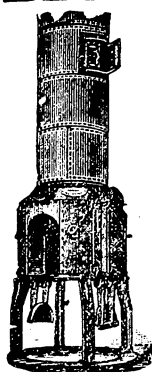
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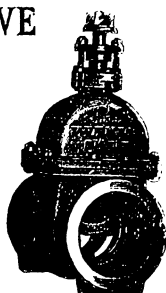
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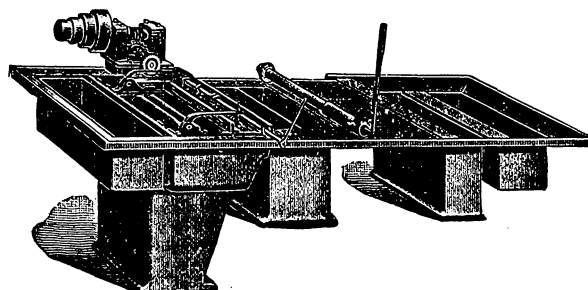


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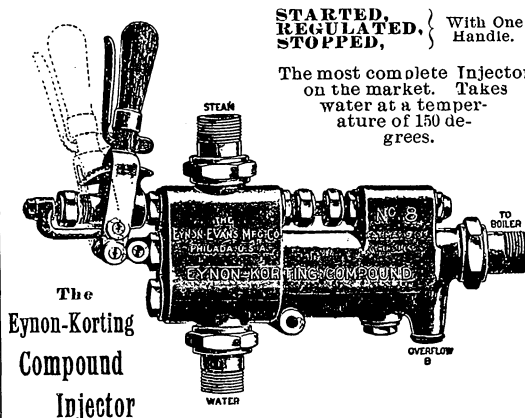
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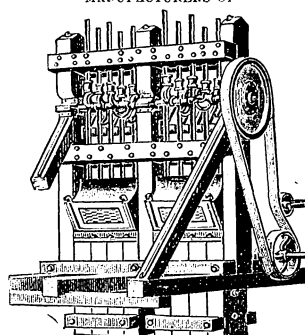
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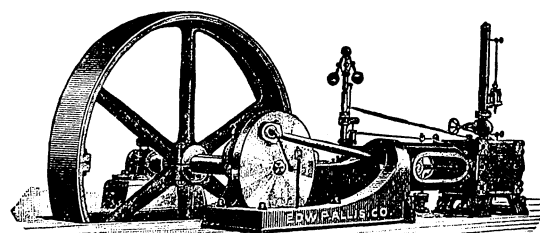
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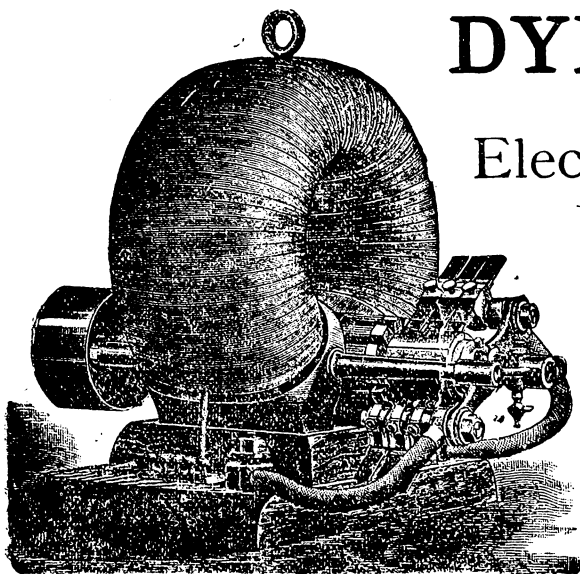
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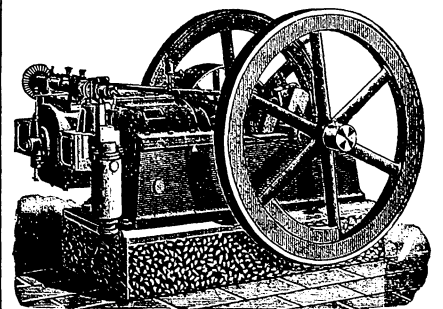
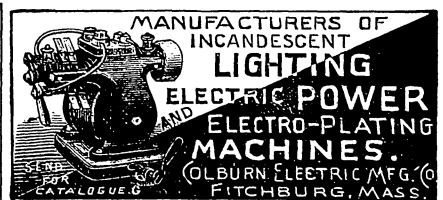
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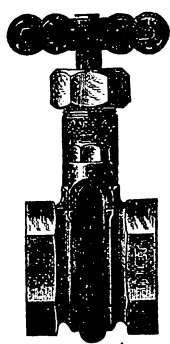
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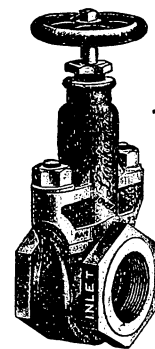
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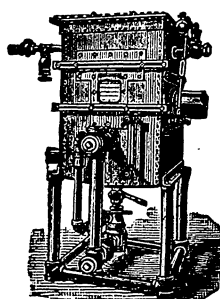
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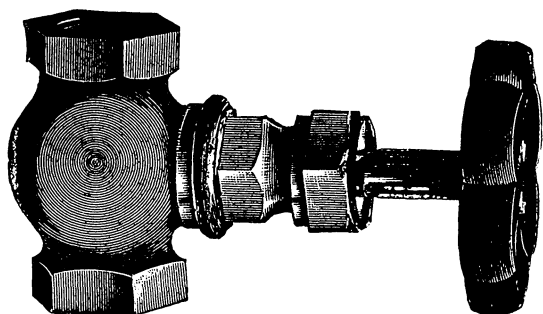
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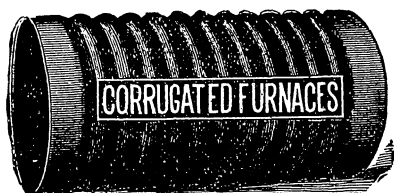
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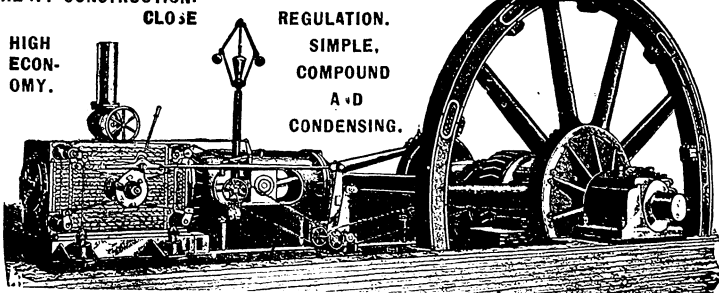
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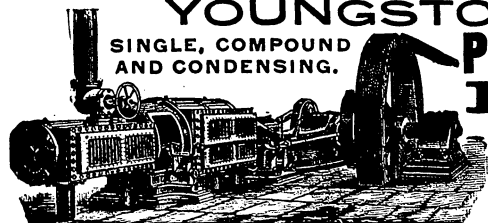
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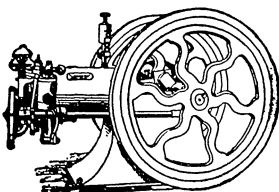
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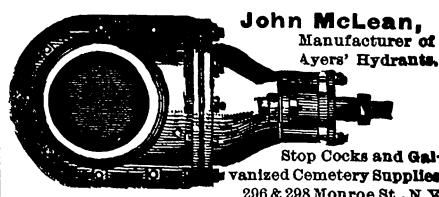
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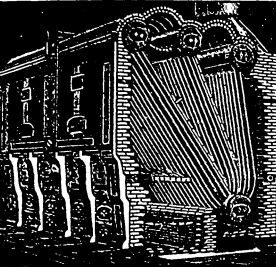
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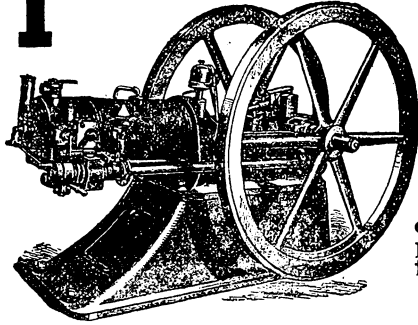
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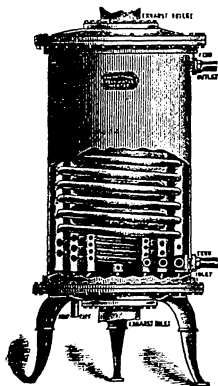
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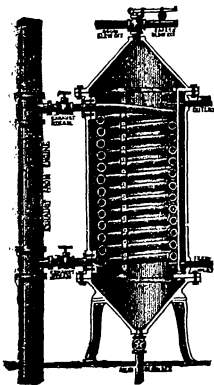
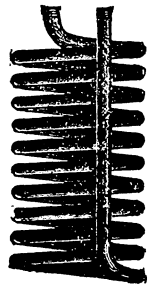


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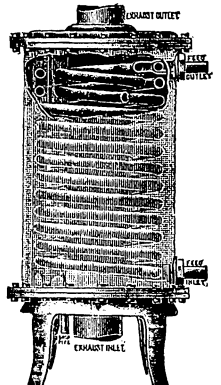
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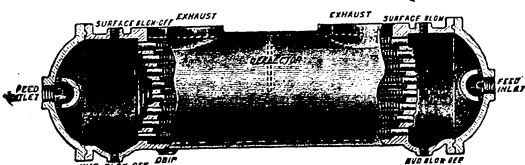
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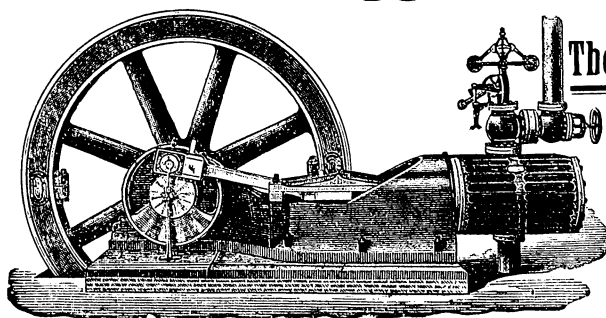
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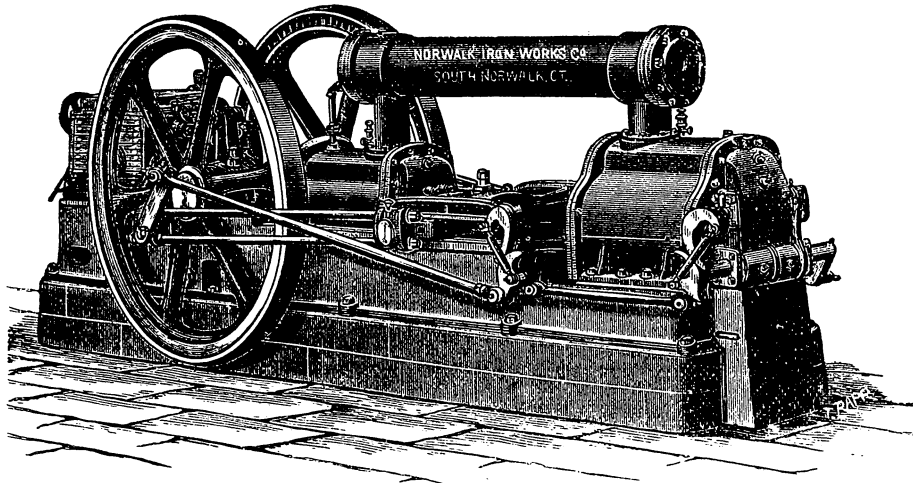
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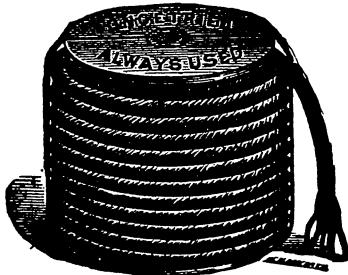
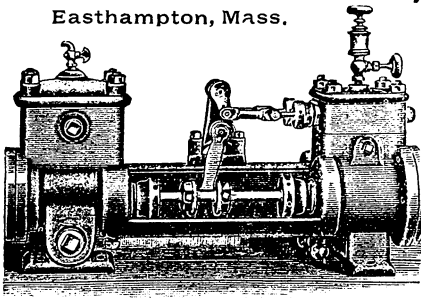
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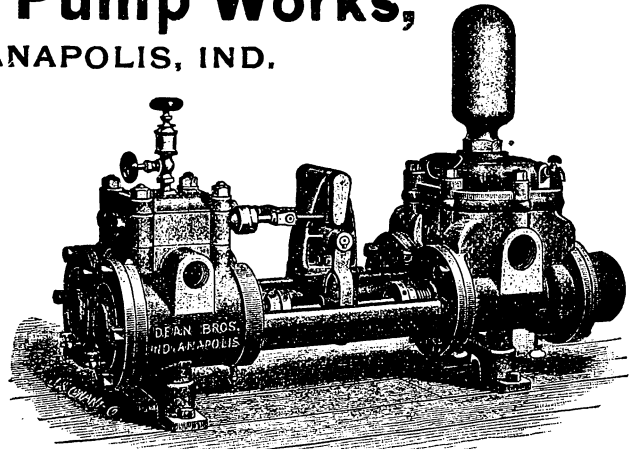
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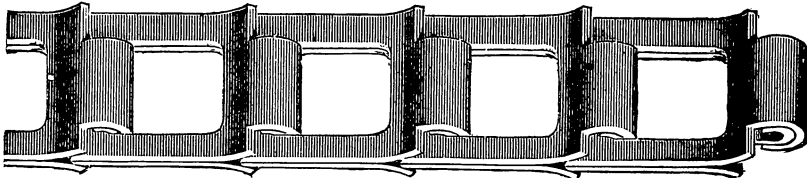
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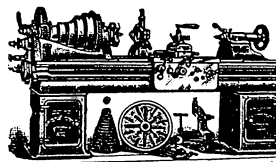
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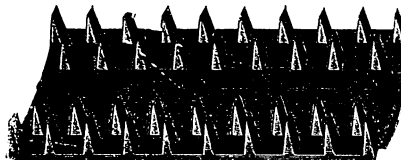
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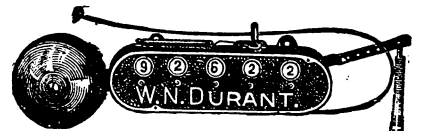
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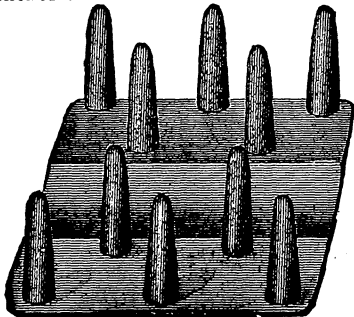
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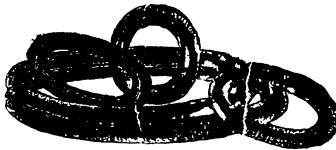
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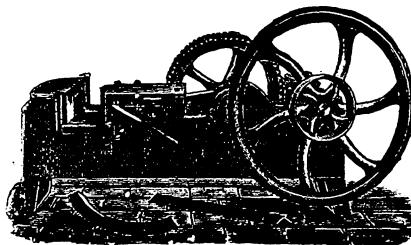
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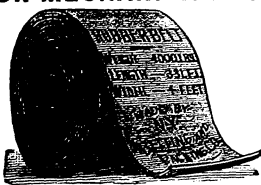
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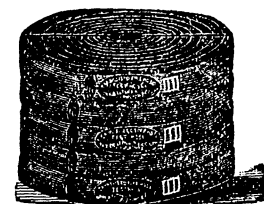


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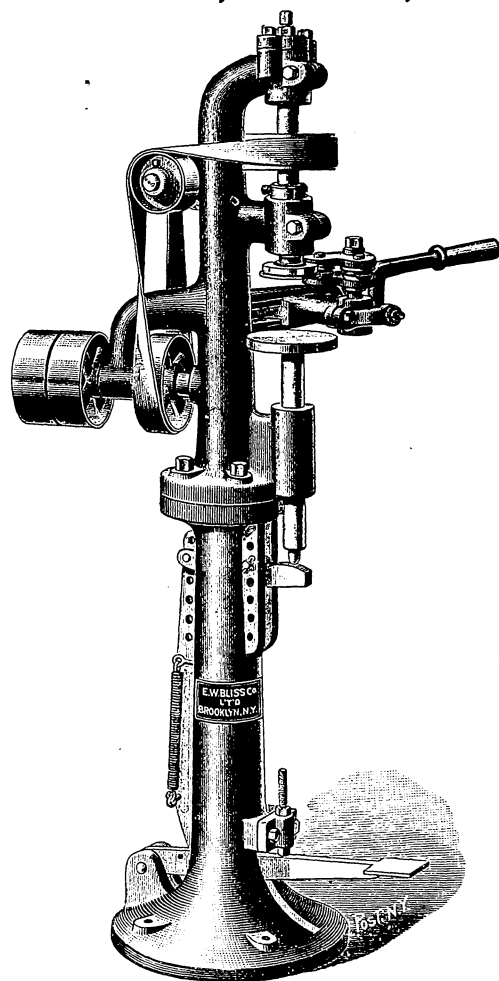
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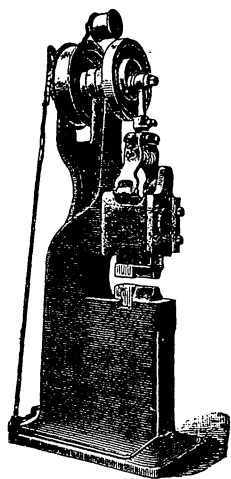


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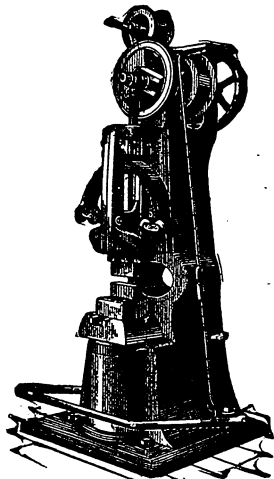
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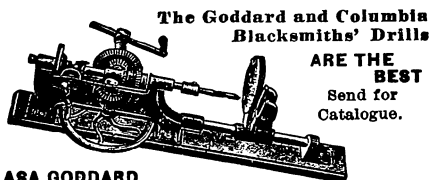
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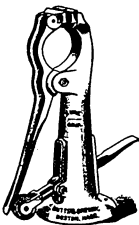
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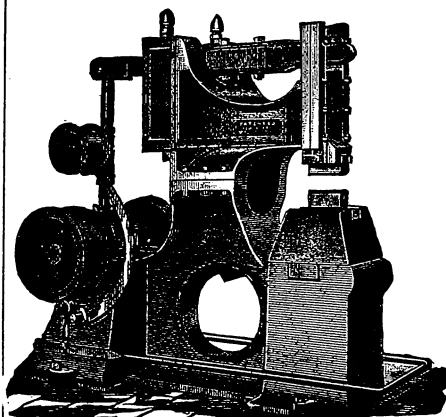
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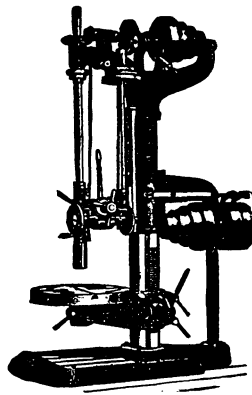
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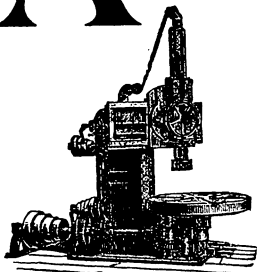
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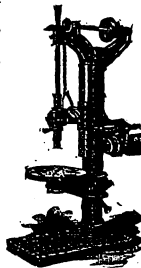
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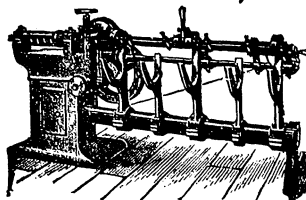
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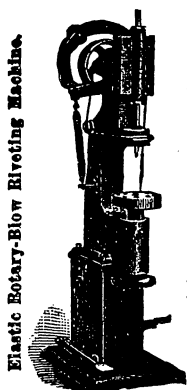
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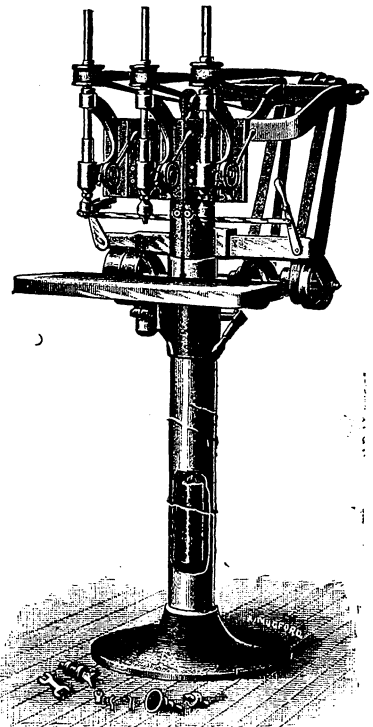


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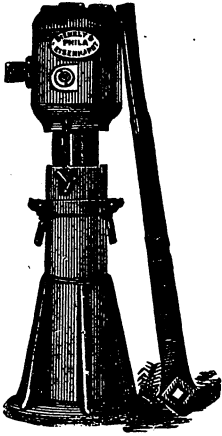
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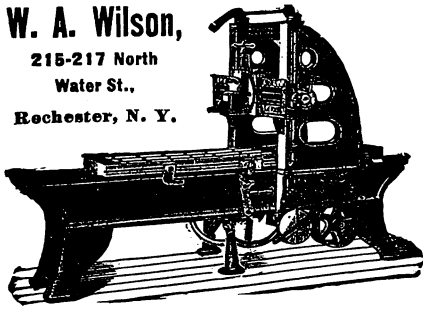
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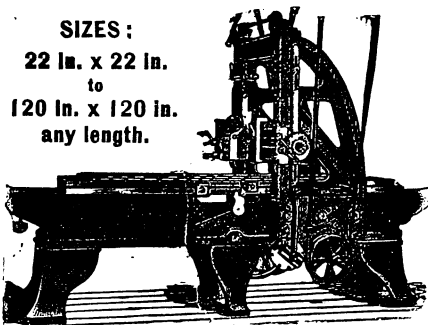


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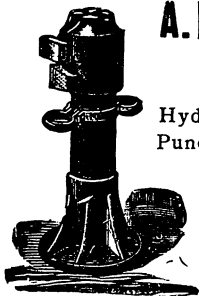
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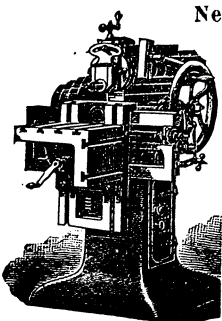
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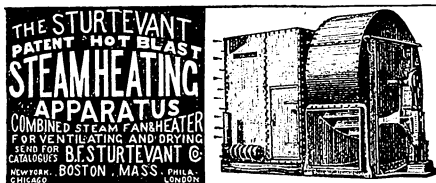
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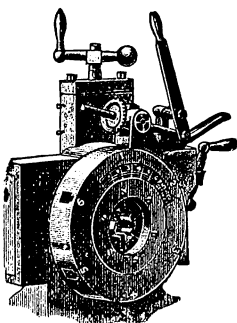
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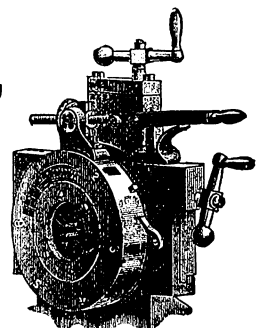
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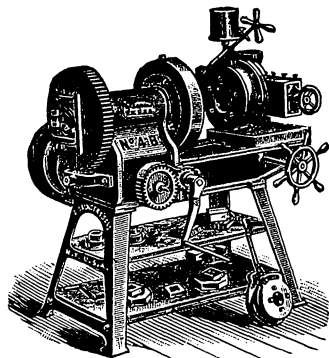
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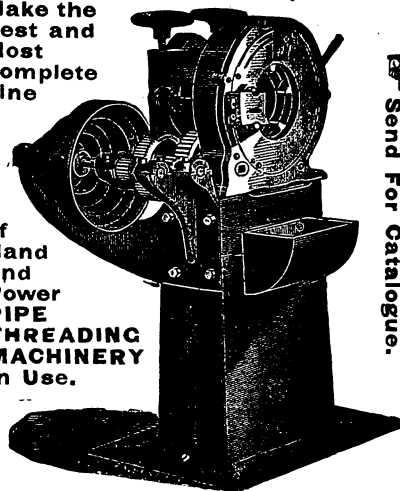
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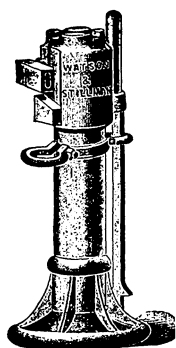
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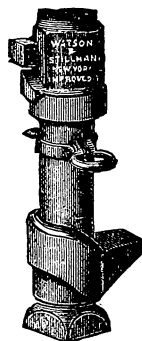
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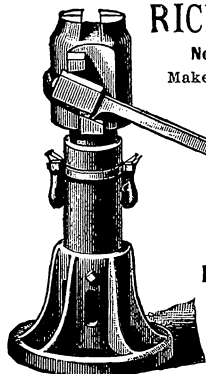
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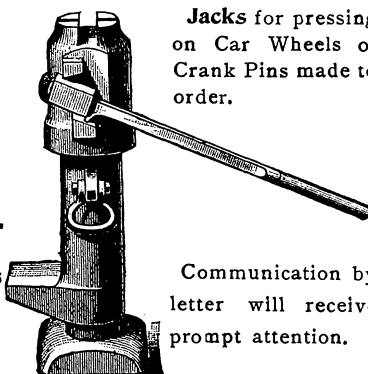
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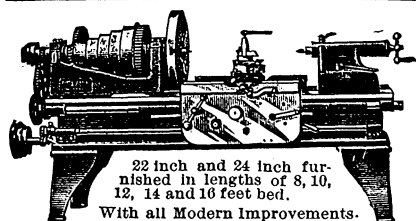
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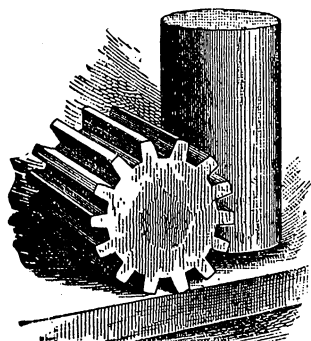


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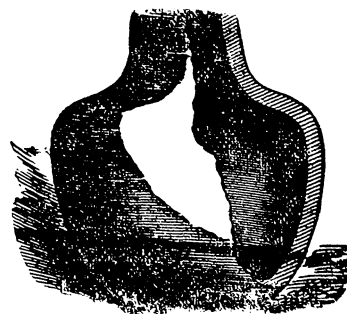
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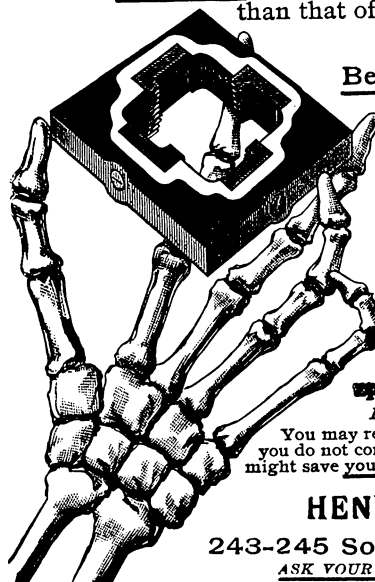
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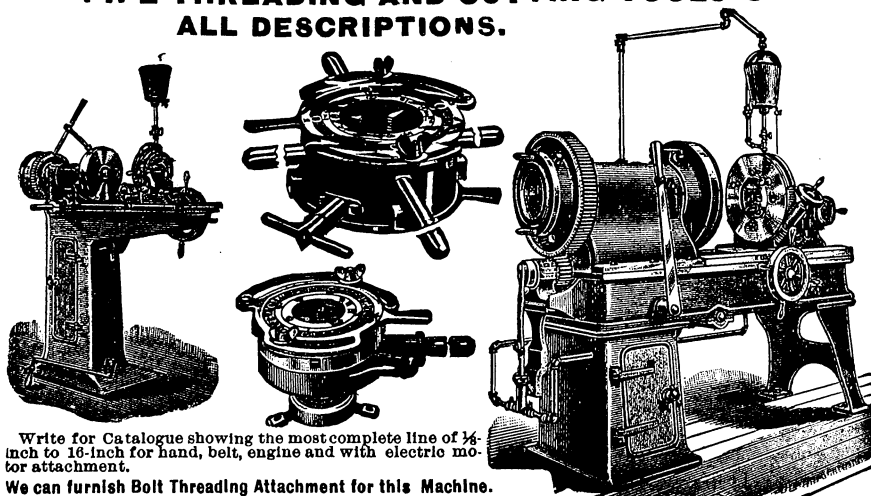
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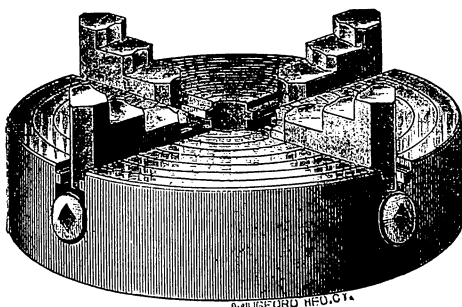
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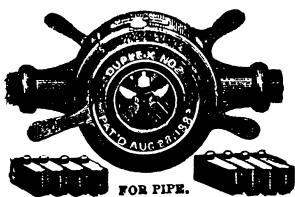
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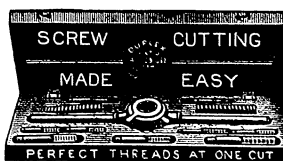


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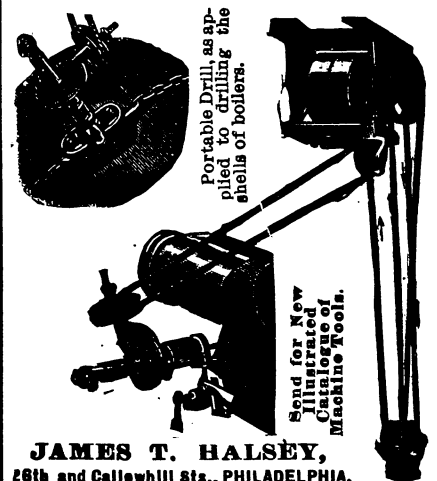
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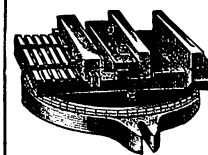
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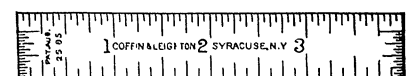
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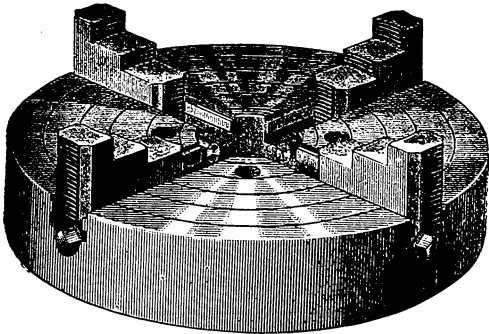
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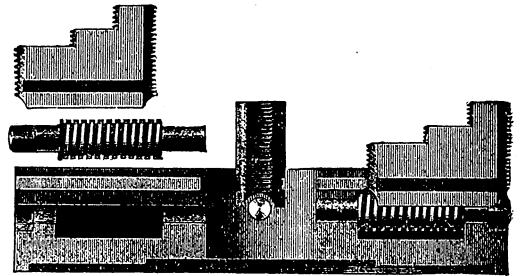
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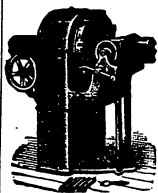


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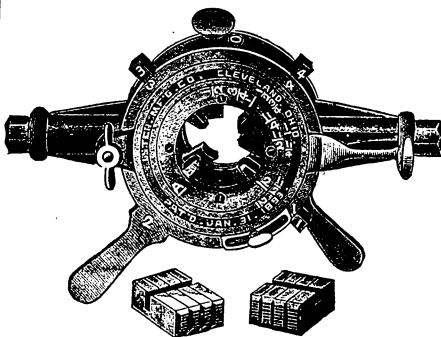
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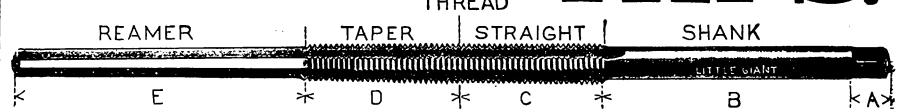
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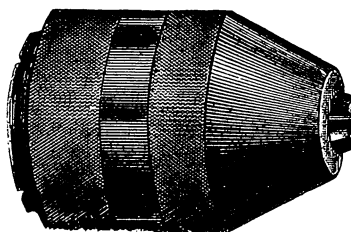
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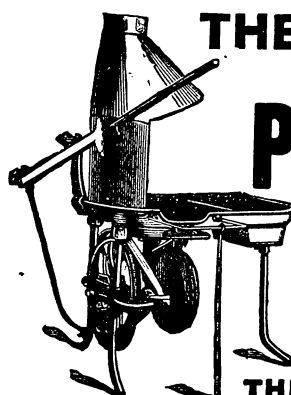
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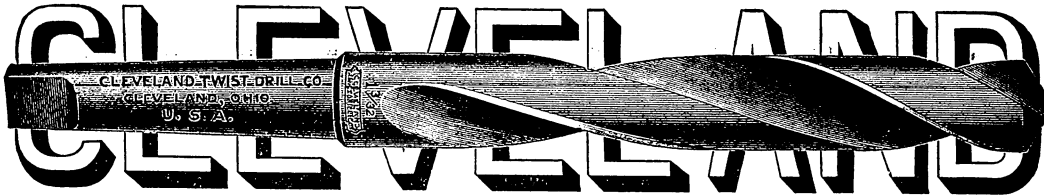
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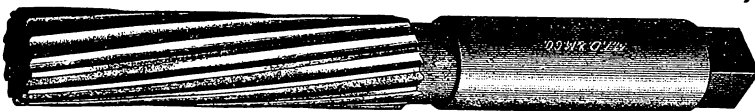
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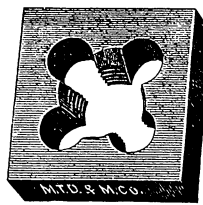


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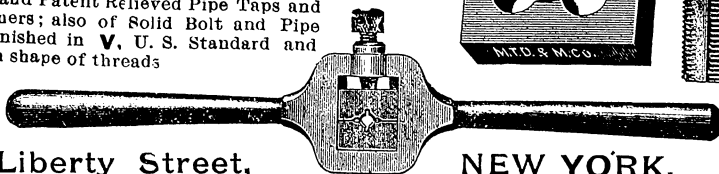
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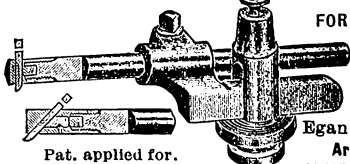
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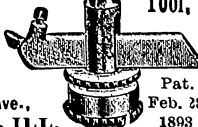
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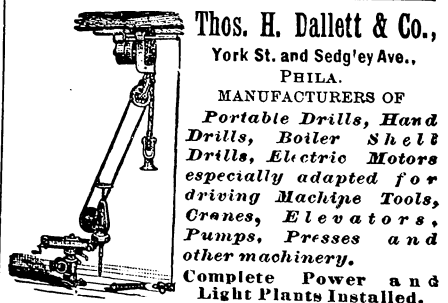
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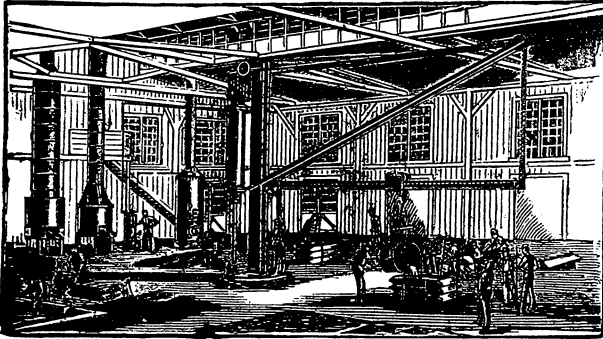


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EDITOR OF "THE FOUNDRY," Detroit, Mich.

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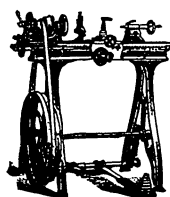


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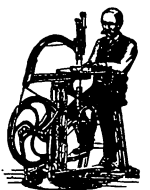
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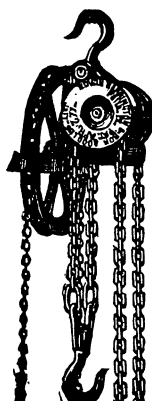


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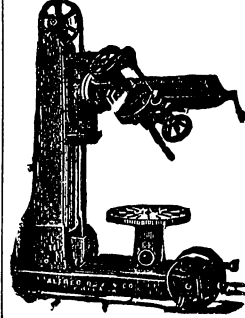
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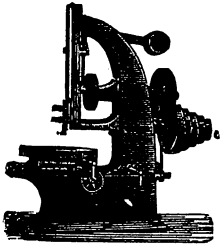
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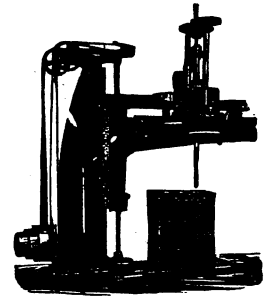


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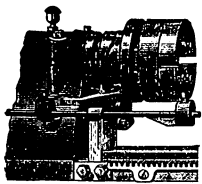
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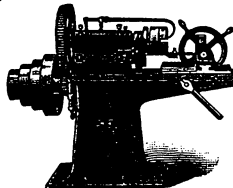
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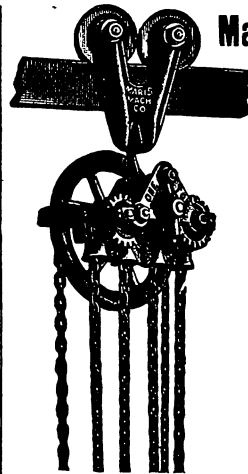
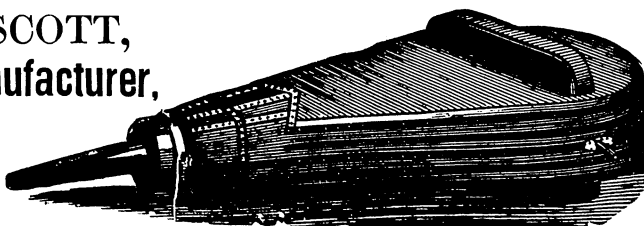
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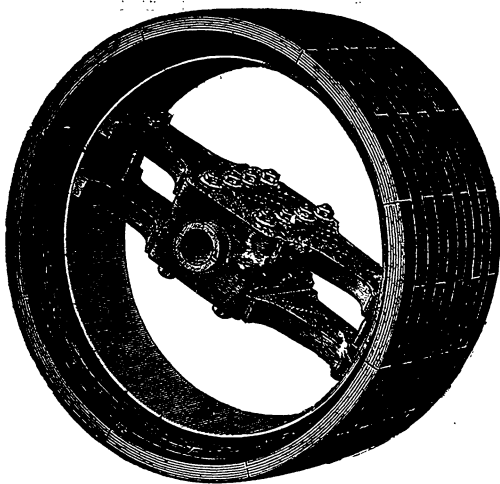
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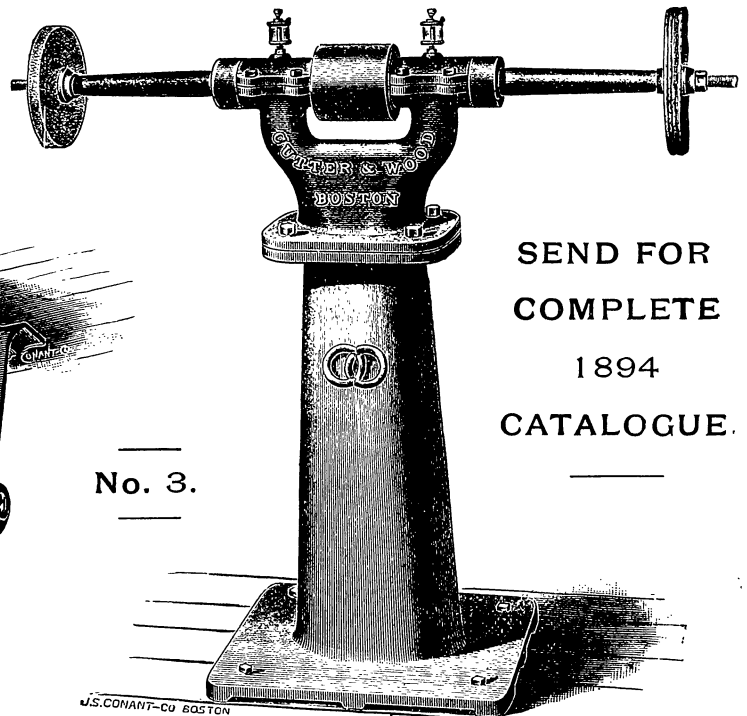
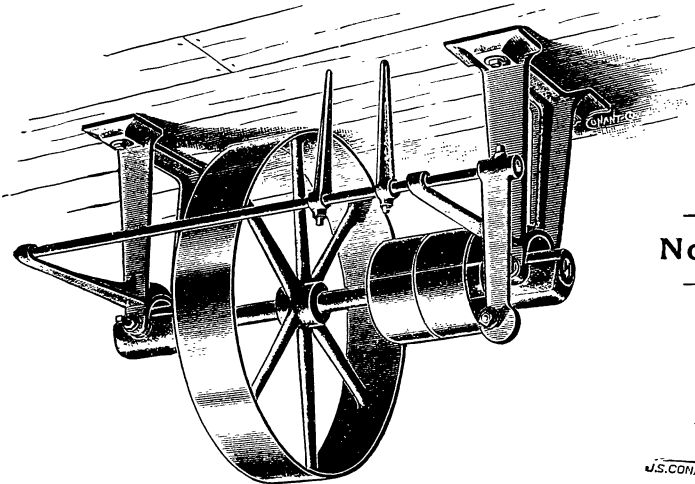
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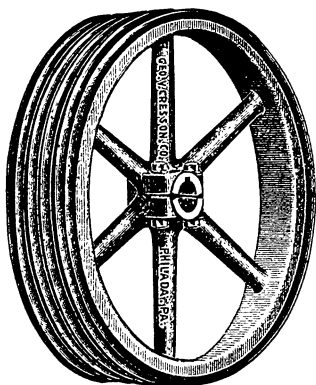


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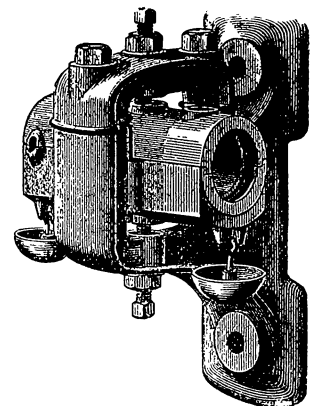
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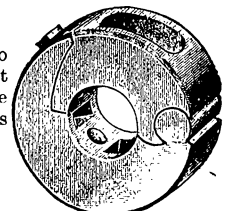
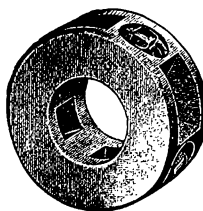
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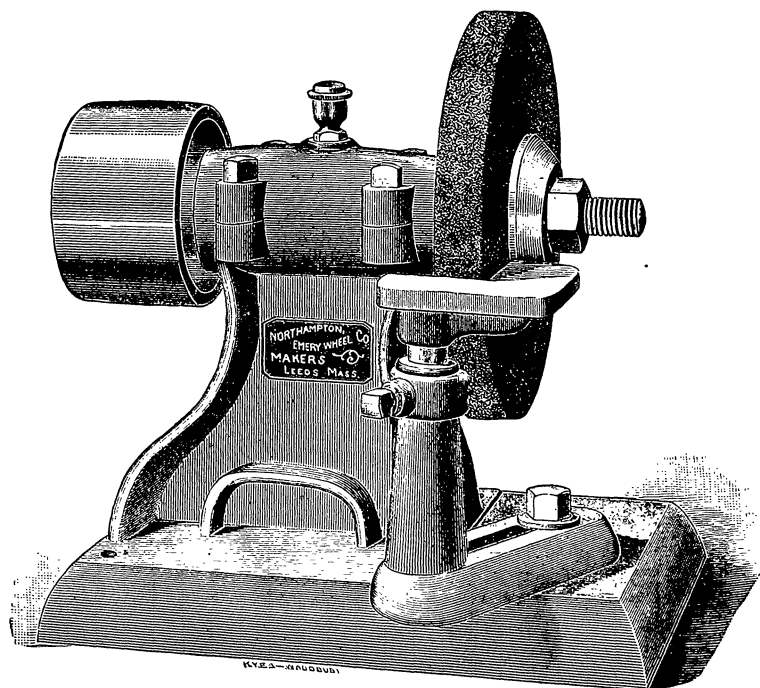


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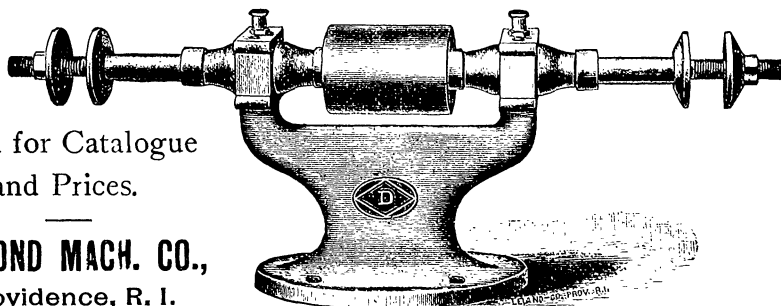
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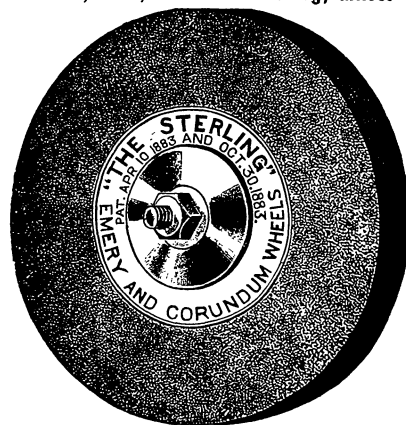
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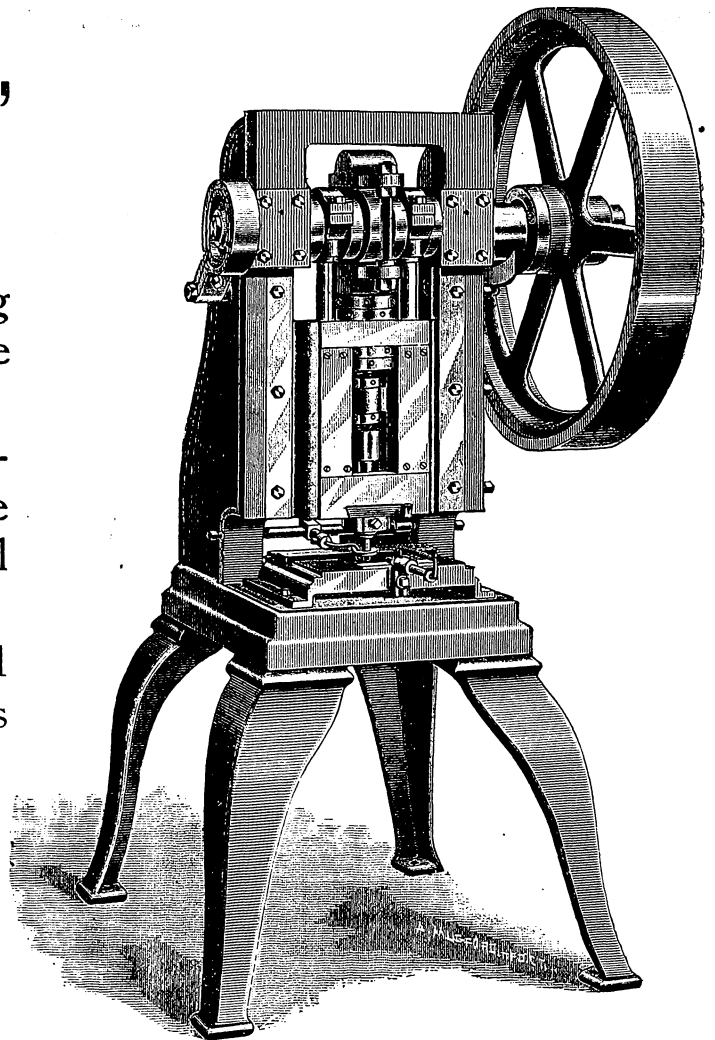
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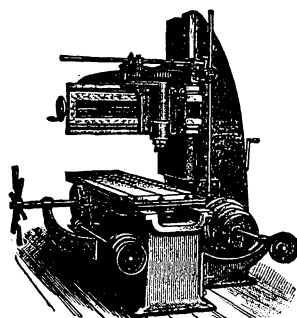
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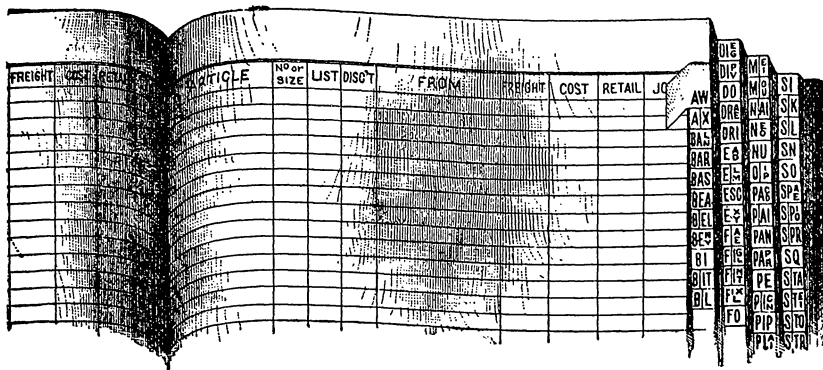
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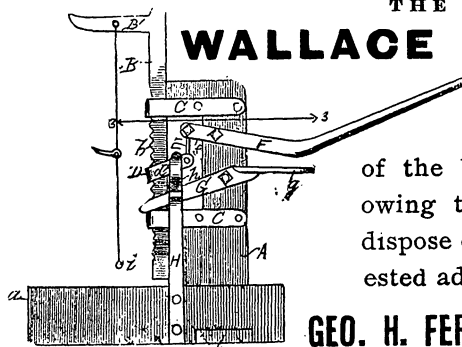
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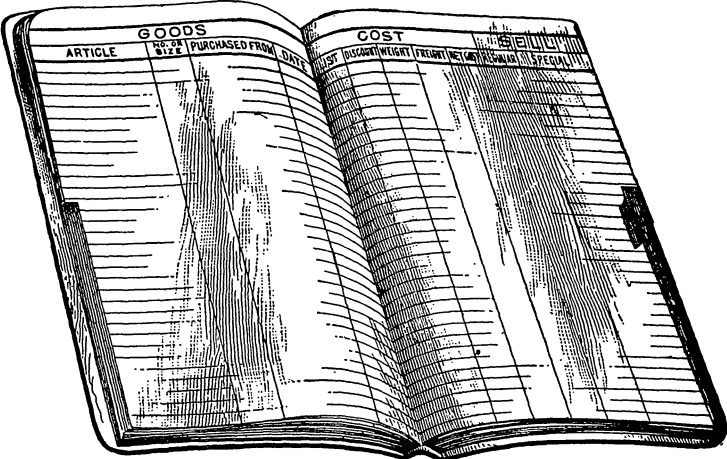
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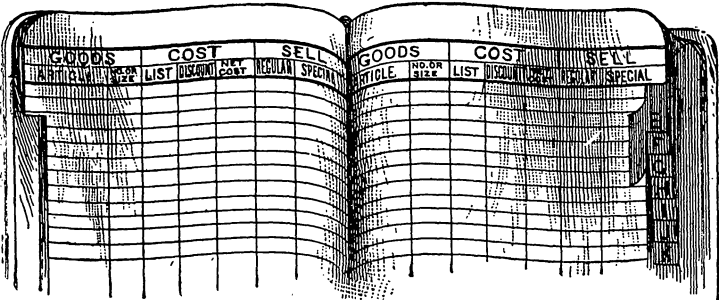
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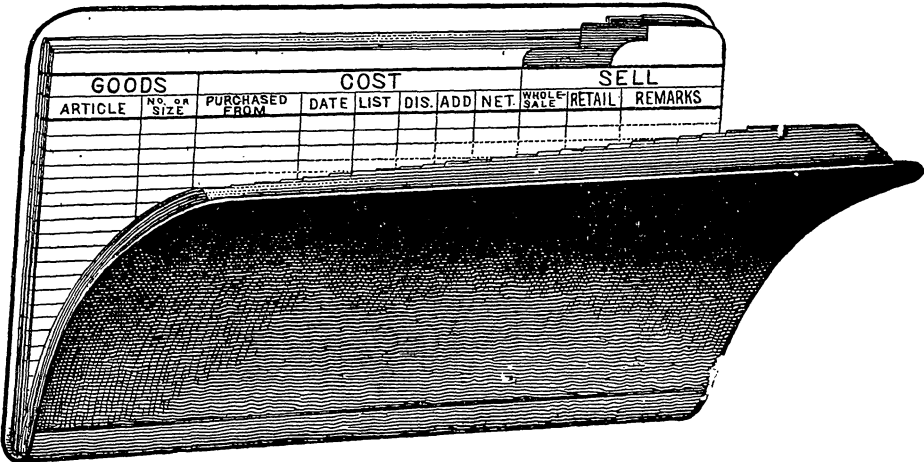
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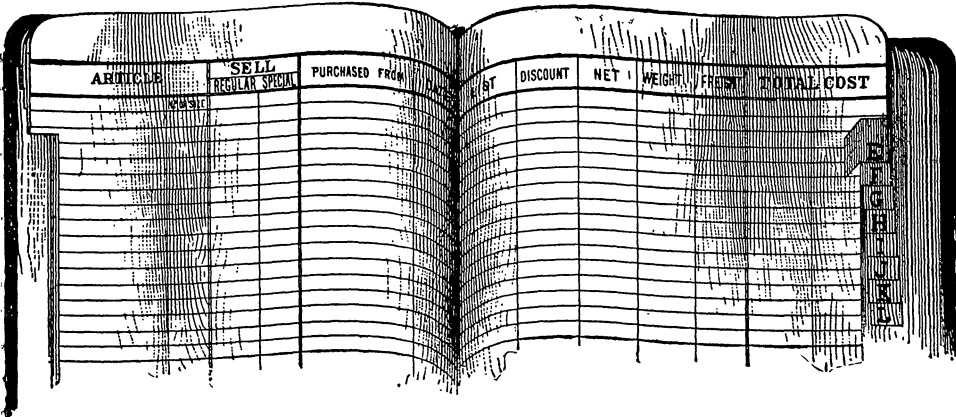
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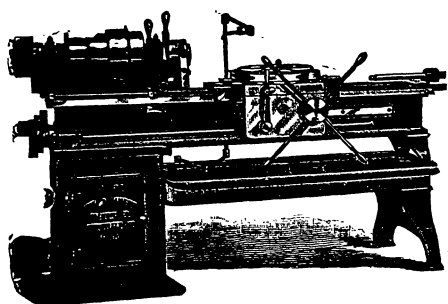


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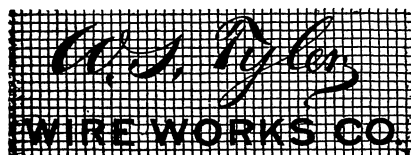
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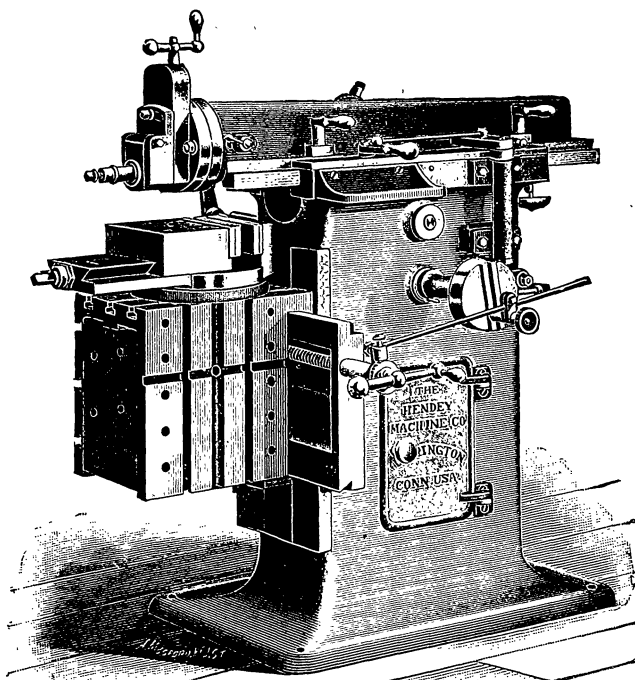
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CHAS. CHURCHILL & Co., London.
EUGEN SOLLER, Basel, Switzerland.

PROFILE or FACE CAM MILLING.

We are prepared to mill **Face Cams** with the utmost accuracy
and perfect in finish at very moderate prices.

For further particulars apply to

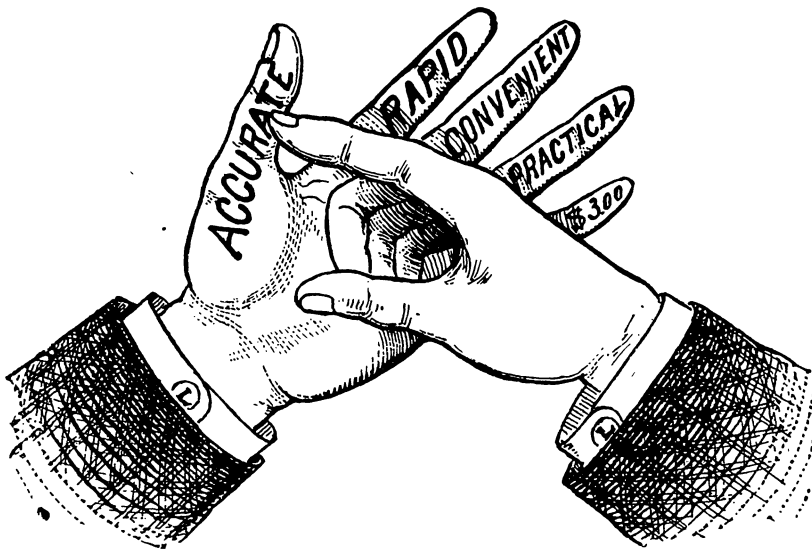
THE NEWARK MACHINE TOOL WORKS,
NEWARK, N. J.

An Early Start for 1895.

In order that unoccupied territory missionary work
for 1895 may be done this year, E. C. Stearns & Co.
are talking about Agencies for 1895. Perhaps you
are the very man they want. Perhaps not. Corre-
spondence or a personal interview will show. It
isn't everybody who will do. Only the best agents
are selling the best machine.

E. C. Stearns & Co., Syracuse, N. Y.

LADD'S DISCOUNT BOOK.



For Example, we desire to find the net of \$73.00 at discount 65, 20, 7½, 5 and 2½ per cent. By the old way we take our pencil, and, after a deal of figuring, conclude (if we haven't made an error) that the result should be \$17.51, but we are not sure of it till we prove it. By the new way (the use of Ladd's Discount Book), we put our finger right on it in a moment, and know that the result is correct.

The book contains over 100,000 computations, and is indispensable where percentages are employed. Price, per mail, \$3.00. Double Indexed Edition, \$4.00.

Sent, post-paid, on receipt of price, by

David Williams, Publisher and Bookseller,
96-102 Reade Street, New York.

WHITE MOUNTAIN FREEZERS.

**THE
BEST
FREEZER.**

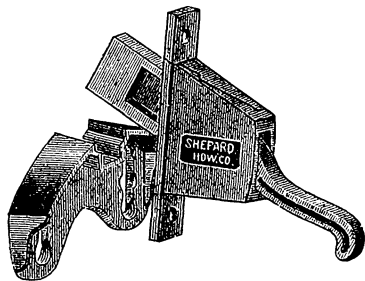
Heavy Waterproof Tubs. Cans of Charcoal Tinplate. Malleable Iron Dashers. All inside parts tin-plated. Gearing completely covered.

Inquire of any leading jobber or write us.

**THE
BEST
SELLER.**

The White Mountain Freezer Co., Nashua, N. H.

A REPUTATION ONCE GAINED MAY BE MAINTAINED.

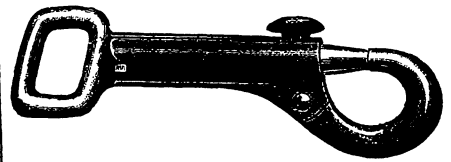


That is why we took advantage of the opportunity to purchase the business of the Shepard Hdw. Co., of Buffalo, N. Y., in Gate Hinges and Latches, Blind and Shutter Hinges and Frame Pulleys, of the original "Clark" and other patterns made by them, which goods are recognized to be the best on the market. Send for our prices.

Wrightsville Hardware Co., Wrightsville, Pa.

SURPLESS, DUNN & ALDER., 15 Murray Street, New York, Agents.
Henry Keidel & Co., Southern Agents, 25 Hanover St., Baltimore, Md.

COVERT'S BANNER BOLT SNAP.



This snap has many important advantages over other makes of Bolt Snaps, viz.: It is lighter, the spring is entirely covered and protected from foreign substances and freezing, and is lower in price.

Made in all sizes: Round, Loop and Open Eye. We are Headquarters and the most extensive manufacturers in Saddlery, Coach and General Hardware Specialties.

Covert's Saddlery Works,
FARMER, N. Y., U. S. A.

Hardware Dealers Can Profitably SELL BICYCLES.

There is a large trade in Bicycles in all parts of the country and much of that trade naturally belongs to dealers in hardware. Good bicycles meet with a ready sale and pay a fair percentage of profit.

COLUMBIAS

Are the representative high grade machines in America. A Columbia is the easiest machine to sell to the best trade because it is unquestionably the standard wheel of the world.

We want enterprising agents of good standing and solicit correspondence.

Pope Mfg. Co.,
221 Columbus Ave.,
Boston, Mass.

MECHANICS



DIPLOMAS AWARDED. Courses in other trades, all including thorough instruction in Mathematics and Physics. Send for FREE Circular, stating subject you wish to study, to The Correspondence School of Mechanics, Scranton, Pa.



Crown. Original Knox. American.

FLUTING MACHINES.

FOR CATALOGUE, PRICE AND DISCOUNTS WRITE TO

North Bros. Mfg. Co., - Philadelphia, Pa.

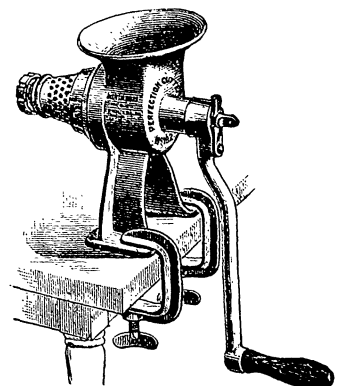
or JOHN H. GRAHAM & CO., Manufacturers' Agents, 113 Chambers St., New York.

G2

The NEW 1894 PATTERN PERFECTION CUTTER.

Improved and Enlarged.

Simple to use.
Easily cleaned.
Of few pieces.
No parts to wear out.



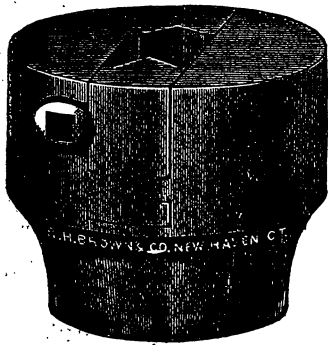
REID DRILL CHUCKS.

THREE SIZES.

No. 0 takes any drill from 0 to 1-2 inch inclusive.

No. 1 " " " " 0 " 3-4 " "

No. 2 " " " " 0 " 1 " "



They are the strongest and most durable made. Drill absolutely in the center. No twisting or bending necessary if drill is straight. Can be fitted to hollow spindle lathes for working long rods.

SEND FOR CIRCULAR.

R. H. BROWN & CO., - New Haven, Conn.

*You take no risk on the quality.
We make only the best!*



Sand Papers
IN
Reams and Rolls

Flint Paper
Garnet Paper
Emery Paper
Emery Cloth

HAIR FELTING for covering Boilers, Steam and Water Pipe, and lining Refrigerators.

BAEDER, ADAMSON & CO.

730 MARKET STREET, PHILADELPHIA.
67 BECKMAN STREET, NEW YORK.
143 MILK STREET, BOSTON.
102 LAKE STREET, CHICAGO.

THE GEM SOLID STEEL MINCER

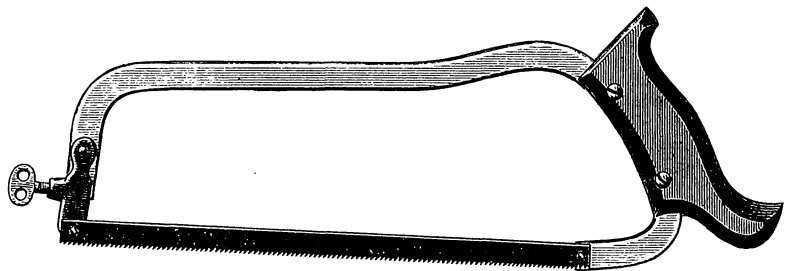


Single
and
Double Blades.

Handle and Blade Formed in one piece.
Always Clean. Indestructible.
No Rivets to Wear Loose.
No Wooden Handle to Shrink, Swell, loosen,
Split, or Fill with Rancid Grease.

MANUFACTURED BY
PALMER HARDWARE MFG. CO.
TROY, N. Y.

Dehorning Saw.

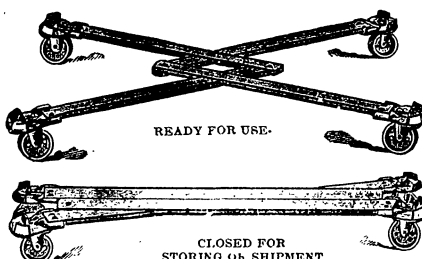


During the past five years large quantities of our Kitchen Saws have been used for dehorning purposes. One reason for this demand is because the Star blade which is furnished with the frame cuts faster and has proved more satisfactory than any other in use for such work. Considering the increasing demand on us we have decided to make a Dehorning Saw Frame similar in pattern to others in market and as cut shown above. We are now prepared to fill orders for these goods. The frame is rough nicked and has a beech handle. The blades are not intended to be refilled but discarded when dull.

Price of Frame complete with 10-inch blade, \$5.00 per doz.
" " extra blades, .85 " "

MILLERS FALLS CO.,
93 READE ST., NEW YORK.

Lock Frame Stove Trucks.



Fit any stove, large or small, without nuts, bolts, screws or yokes. Have the best ball bearing casters. Fully warranted. Price, \$15.00 and \$18.00 per dozen.

FOR SALE BY MANUFACTURERS

RANDALL & WARD,

Le Roy, N. Y.



CABINET LOCKS

OF EVERY KIND.

DRAWER LOCKS,
CUPBOARD LOCKS,
WARDROBE LOCKS,
CHEST LOCKS,
DESK LOCKS.

A complete line of more than 1000 list numbers exclusive of our old
and complete line of

YALE CABINET LOCKS.

THE YALE & TOWNE M'F'G CO.,

STAMFORD, CONNECTICUT.

New York. Chicago. Philadelphia. Boston. Pittsburg. San Francisco.

The only question is Is it Le Page's?

If it is you have made a sale. **HUNDREDS** of **THOUSANDS** of **PLEASED** and **SATISFIED** **CUSTOMERS** testify to the merits of

~LE PAGE'S LIQUID GLUE.~

If you sell it you do not have to **WASTE ANY TIME** in answering questions as to its quality.

The people **KNOW** that **LE PAGE'S GLUE** is the **BEST**. They have used it for years and have proved our claims to be true.

It is the only Glue made WITHOUT ACIDS.

A dealer who regards his time as worth anything will not risk losing his **CUSTOMERS' CONFIDENCE** by trying to sell something which is **CLAIMED** to be "just as strong" and "just as good as LePage's."

Don't let your customers go to another store for what they want, but **SELL THEM WHAT THEY ASK FOR.**

We can furnish original and attractive advertising matter for "**LE PAGE'S GLUE**" upon request.

SEND FOR CIRCULARS AND PRICE-LIST.

RUSSIA CEMENT CO., Gloucester, Mass.

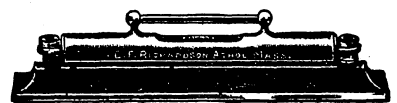
NEW YORK OFFICE, 95 Reade and 113 Chambers Streets.

PACIFIC COAST OFFICE, 23 Davis St., San Francisco, Cal.

NEW ADJUSTABLE BENCH LEVEL.

WITH GROUND AND GRADUATED VIAL.

4-6 and 8 inch.



Three Sizes.

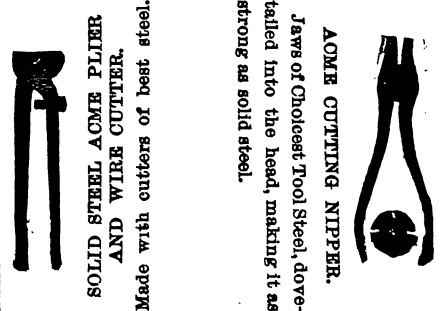
MANUFACTURED BY

C. F. RICHARDSON & SON,

ATHOL, MASS.

ACME CUTTING TOOLS.

Made in all Sizes.



HIGGANUM HARDWARE CO., HIGGANUM, CONN.

New York Office, 18 CHIEF Street.

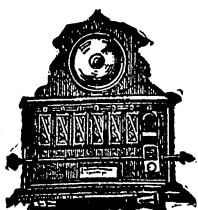
— REMEMBER —
WE MAKE ONLY

The Very Highest Grade
OF
MECHANICS' TOOLS.

M. H. MAYHEW CO., Shelburne Falls, Mass.

Boxes Made Absolutely Secure
BY USING THE **PORTABLE**
BOX BANDER

ONE MAN CAN BAND
YOUR BOXES QUICKER THAN TWO
MEN CAN IN ANY OTHER WAY.
HOOP IRON WIRE OR ANY OTHER FLEXIBLE MATERIAL CAN BE USED EQUALLY WELL. Send for price
SOON PAYS FOR ITSELF **J.W. GOODSELL** - BURLINGTON, VT.

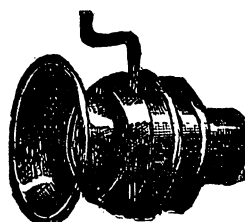


W. R. OSTRANDER & CO.,

204 FULTON STREET, NEW YORK,
Manufacturers of

**SPEAKING TUBES, WHISTLES, ORAL, ELECTRIC
MECHANICAL AND PNEUMATIC ANNUNCIATORS
AND BELLS.**

Complete outfits of Speaking Tubes, Whistles,
Electric, Mechanical and Pneumatic Bells. A full line
always in stock. Send for new catalogue. Factory,
DeKalb ave. near Knickerbocker, Brooklyn, N. Y.



W. & B. DOUGLAS, MIDDLETOWN, CONN.

Branch Warehouses: 85 and 87 John St., New York; 197 Lake Street, Chicago, Ill.

THE OLDEST AND MOST EXTENSIVE MANUFACTURERS OF

Pumps, Hydraulic Rams, Garden Engines,

Yard Hydrants, Street Washers, Galvanized Pump Chain, Wind Mill Pumps and other Hydraulic Machines in the World.

DOUGLAS' DIAPHRAGM PUMPS, "Loud Patent."

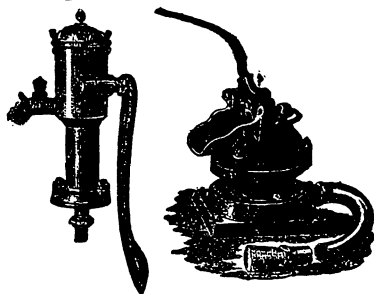
A LARGE CAPACITY AND EASY WORKING PUMP FOR

Water Works, Sewer Contractors, Foundation Builders, Mines, Quarries;

Fig. 209.

Fig. 881.

Fig. 145.



or wherever it is desired to raise a large quantity of water by
hand power.

The pump has large valves (accessible by hand), and will pump water containing sand, gravel, sewage matter, &c., without choking or any perceptible wear.

CAPACITY

from 3,000 to 4,500 gallons per hour.

These pumps are simple, durable and low priced.
Made either as shown in cut for Hose or for IRON Pipe Suction underneath.

Send for Circular and Price List.



C. I. Grindstone Frame.

THE DEMING
FACTORY
SALEM O.U.S.A.
MANUFACTURERS OF
HAND & POWER
PUMPS
WELL
SUPPLIES
& C. VERTICAL STEAM PUMPING
ARTESIAN
WELL
CYLINDERS
HYDRAULIC
RAMS
ENGINES
N.Y. OFFICE,
72 JOHN ST.
NEWTON & HUBBELL
GEN'L WESTERN AGTS
35 & 37 N. CLINTON ST.
CHICAGO, ILL.

PRENTISS' PAT. VISES.

The Leaders for 20 Years.

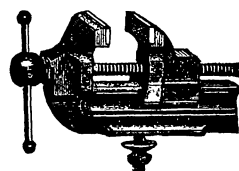
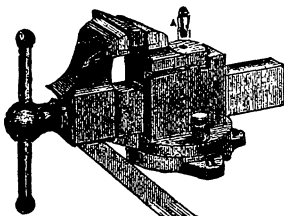
Send for Illustrated Catalogue
of

ALL KINDS OF VISES.

PRENTISS VISE COMPANY,

MANUFACTURERS,

44 Barclay St., New York.



FINEST MECHANICAL TOOLS.

PATENT

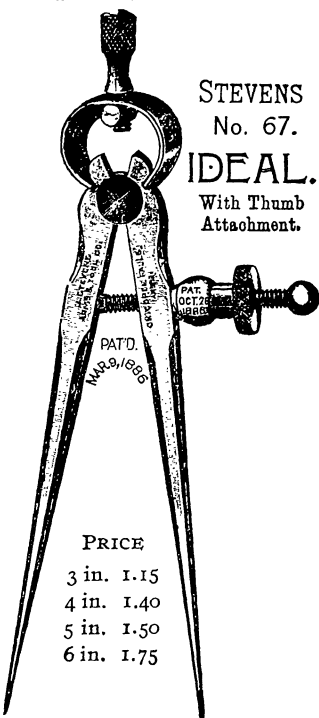
Spring Dividers.

**J. Stevens Arms
& Tool Co.,**

P. O. Box 5729,

Chicopee Falls, = Mass.

SEND FOR CATALOGUE OF FULL LINE.



PRICE

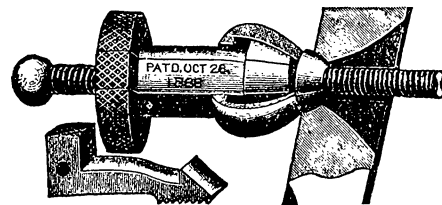
3 in. 1.15

4 in. 1.40

5 in. 1.50

6 in. 1.75

DUPLICATE PARTS.



"IDEAL"

Patent Nut and Washer Combined,

SHOWING SECTIONAL PARTS.

The nut is closed against the screw by means of a washer which slides on the screw, and which, when forced toward the nut acts by means of inclined surfaces to press the sections of the nut against the screw.

F.E. MYERS & BRO.



Ashland Pump and Hay Tool Works

The New York Safety Dumb Waiter.
"The Manhattan Dumb Waiter."
"The Improved Humphrey Hand Elevator."
Made specially to be sold by Hardware Stores.
Thousands in use. Catalogues on application.
THE STORM MANUFACTURING CO.
NEWARK, NEW JERSEY.
Formerly of Roughneck, New York.

BOOKS. YOU CAN OBTAIN PROMPTLY the latest work on any subject in which you are interested by addressing **DAVID WILLIAMS** Publisher and Bookseller, 96-102 Reade Street, New York.

STANDARD TOOL CO.
MANUFACTURERS OF
Mechanics' Fine Tools.
ATHOL, MASS. U.S.A.
EVERY TOOL WARRANTED.
Catalogue Free.

Athol Machine Co.,
Selling Agents.



HOLLANDS' OFFSET JAW VISE.

Specially adapted for drill press work where chucks cannot be used and equally good for special or regular bench work.

Hollands Mfg. Co.,
ERIE, PA.,
Manufacturers all styles VISES.

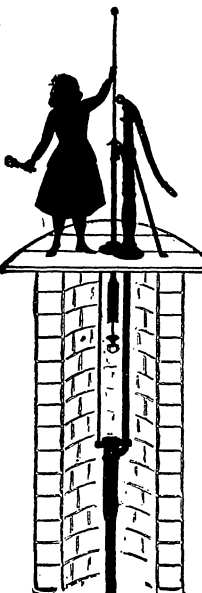
Red Jacket Mfg Co.
DAVENPORT IOWA, U.S.A.

Manufacture the
Only Pump
in the U. S.

that works easily in wells of any depth, and can easily be fixed by any one with a monkey wrench without taking the pump from well or tearing up the platform.

WRITE FOR PRICES.

Chas. Millar & Son,
General Eastern Agts.,
UTICA, N. Y.




Extension Rules and Hardware Specialties.
Send for Catalogue.

RANSON HARDWARE CO., Burlington, Vt.

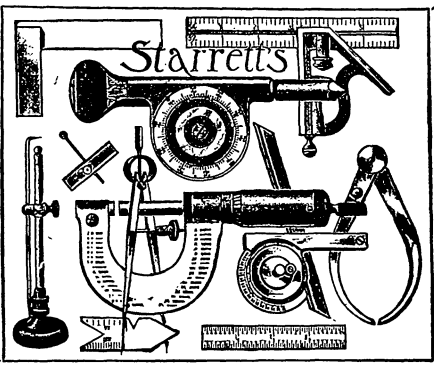
Practical Hints on Joint Wiping, For Beginners in Plumbing. This book contains a reprint from *The Metal Worker* of two articles on the method of Joint Wiping, an operation calling for a very large degree of manual skill. It is illustrated from photographs representing the hands and tools when wiping joints in various positions, and gives all the assistance that description of the work can furnish. With thirty-five illustrations, 43 pages, paper, \$0.25

For sale by David Williams, 96-102 Reade St., N. Y.

Skilled mechanics prefer them Live dealers sell them

STARRETT'S

Best in workmanship
Finest in finish
Latest in improvements



For all workers in metal or wood
Every tool warranted satisfactory

FINE TOOLS

Send for Catalogue L. S. Starrett, Athol, Mass.

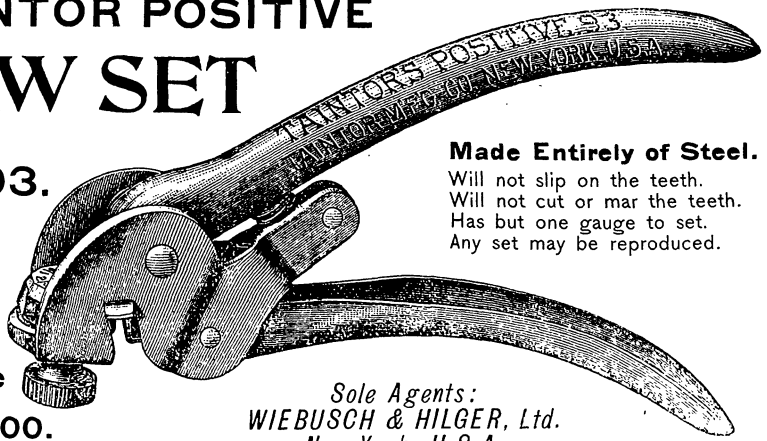
TAINTOR POSITIVE SAW SET

No. 93.

....

Retail

Price
\$1.00.



Made Entirely of Steel.
Will not slip on the teeth.
Will not cut or mar the teeth.
Has but one gauge to set.
Any set may be reproduced.

Sole Agents:
WIEBUSCH & HILGER, Ltd.
New York, U.S.A.

"RELIABLE"
Steel Measuring Tapes.



Entirely new. Handle or crank when closed is perfectly flush with leather case. Opens by pressing button on opposite side and folds out double, giving increased leverage. Best and most convenient steel tape on the market. Fully guaranteed. Will send samples on approval.

LUFKIN RULE CO., - SAGINAW, MICH.
NEW YORK OFFICE, 2½ MURRAY ST.

The Canton Glass Board.

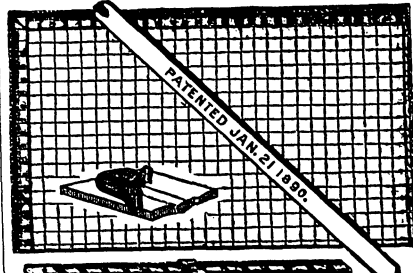
Cuts any Fraction of an inch by Eighths.

Unequaled for accuracy and quick work in cutting square or at any angle. Saves breakages, &c.

— ALSO —
IMPROVED TRAMMEL RULE for Cutting Circles
From 3 inches up to 48 inches, Segments, Gothic Shapes, &c.

Send for Circular.

The Canton Saw Co., Canton, Ohio.



GEO. N. CLEMSON, Pres.

S. S. BATTIN, Vice-Pres.

ROBERT J. JOHNSON, Treas.

F. B. EARLE, Sec.

THE NATIONAL SAW CO.,

OPERATING

Wheeler, Madden & Clemson Mfg Co., Wood-rough & McParlin, Richardson Brothers, Harvey W. Peace Co., Monhagen Steel Works, Wood-rough & Clemson, Pennsylvania Saw Co.

SEND FOR PRICE-LIST.

GENERAL OFFICE:

NEWARK, - - New Jersey.

SAWS

WENTWORTH'S PATENT NOISELESS SAW VISES,

WITH RUBBER CUSHIONED JAWS.

Prevent all vibration and render Saw Filing noiseless.
Will make no more noise than Filing on a Solid Piece of Iron.

Have a Larger Sale than All Other Kinds Combined.

PRICE LIST.

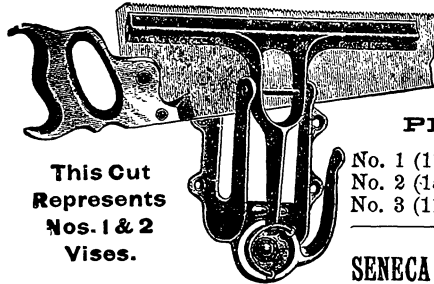
No. 1 (11 inch Jaws),	-	PER DOZ.
No. 2 (15 inch Jaws),	-	\$15.00
No. 3 (11 inch Jaws),	-	21.00
	-	18.00

LIBERAL DISCOUNT TO THE TRADE.

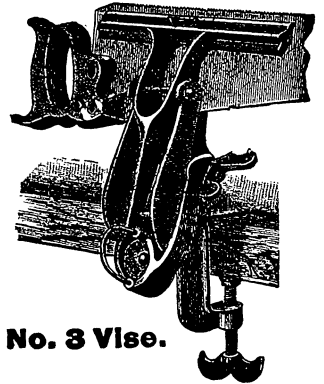
LONGEST JAWS, HEAVIEST AND
BEST FINISHED.
Sold by all leading jobbers of general Hardware at Factory Prices.

—MANUFACTURED BY—

SENECA FALLS MFG. CO., 255 Water St., Seneca Falls, N. Y.



This Cut
Represents
Nos. 1 & 2
Vises.



No. 3 Vise.

E. C. ATKINS & CO., Indianapolis, Ind.

BRANCH HOUSES:
Memphis, Tenn.
Minneapolis, Minn.
Chattanooga, Tenn.

Circular, Band, Cross-Cut and Hand Saws.

Diamond.
Rex.
American.

Dexter.
Lance.
Columbian.



ORIGINAL
TUTTLE TOOTH.

THE BEST SAW IN THE WORLD FOR THE MONEY.

Fine Steel, Patent Temper.

Furnish your Trade with the Best Saws.

The ATKINS Saws Lead them all.



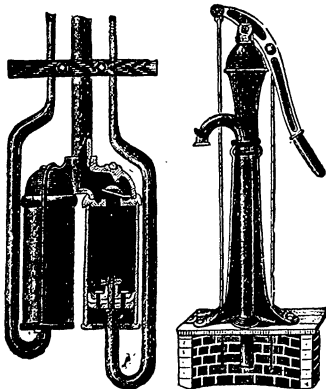
Write for Price-List and Trade Prices.

ATKINS

ATKINS

Peters Double Cylinder Force Pump.

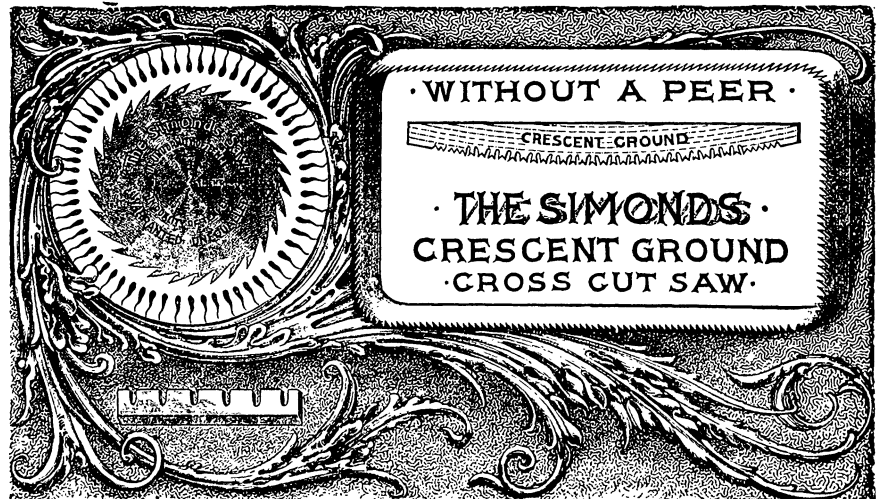
EASIEST WORKING PUMP IN THE MARKET.



Will send any responsible dealer a sample to be returned in 30 days if not perfectly satisfactory.

WRITE FOR CIRCULARS AND PRICES.

PETERS PUMP CO., - KEWANEE, ILL.



· WITHOUT A PEER ·

CRESCENT GROUND

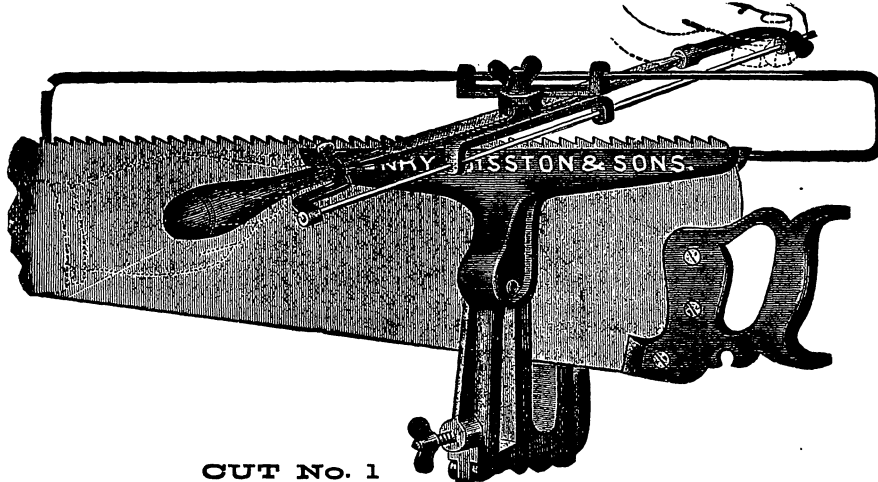
· THE SIMONDS ·
CRESCENT GROUND
CROSS CUT SAW.

Simonds Mfg. Co. Simonds Saw Co.

FITCHBURG, MASS. CHICAGO, ILL. SAN FRANCISCO CAL. PORTLAND, ORE.

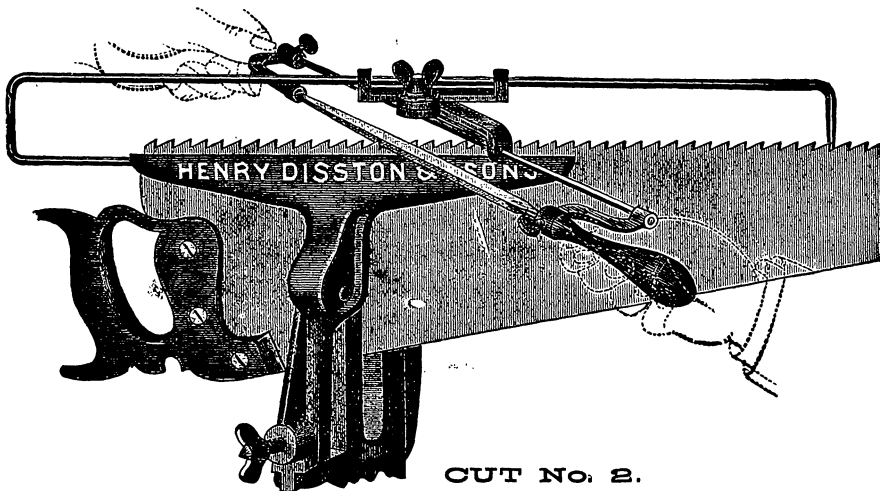
DISSTON'S Improved Saw Clamp AND FILING GUIDE.

ESPECIALLY DESIGNED TO ASSIST THOSE NOT SKILLED IN THE ART
OF SAW FILING TO FILE A SAW CORRECTLY.



CUT No. 1

Cut No. 1 shows a saw and the attachment in proper position for filing the first side; and Cut No. 2 shows the saw and attachment reversed and in position to file the second side. There are three marks on one of the hubs of the swivel attachment, and one mark on the other. One of the three marks shows when it is in position No. 1, and the other designates when it is in position as shown in No. 2. The third, or centre, marks show when it is in position for filing Rip Saws.



CUT No. 2.

To obtain the correct position, loosen the wing nut and move the guide around to the point desired; after tightening wing nut, loosen screw in file handle, then turn handle until file gives the shape tooth wanted.

A good way is to select a tooth of correct shape and let file down into it, tighten set screw in handle, then file a tooth to see if the shape suits. If not turn the file a little to the right or left and try another tooth until the proper shape is obtained. Then file every other tooth, see cut No. 1; when one side is filed, reverse saw and attachment and adjust as in No. 2, and file the other teeth. For Rip Saws, place the file at right angles with the saw and file every tooth. Always keep the file as nearly horizontal as possible.

This filing guide is sold only attached to our No. 3 Improved Clamp or Vise, and not sold separately. We recommend this as the best saw clamp on the market, being quickly and easily adjusted, and not liable to get out of order.

Write for price including No. 3 Clamp, Filing Guide, File and Handle complete: Packed one in a wooden box.

Henry Disston & Sons, Philadelphia, Penn.

INCORPORATED.



EASTERN OFFICE.
NEW YORK.

ARCADE FILE WORKS.

WARRANTED FILES AND RASPS.

FACTORY,
ANDERSON, IND.

WESTERN OFFICE.
CHICAGO.

THE FILES THAT LEAD THEM ALL

THE BEST EQUIPPED FILE WORKS IN THE WORLD.

The fact that the Arcade File Works alone use the improved File Machinery recently invented by Alfred Weed, and the even heat of natural gas, enables them to produce files that cut faster and wear longer than any on the market.

Warranted Better than the Best ENGLISH ANVIL

Face in one piece of BEST TOOL CAST STEEL, PERFECTLY WELDED, perfectly true, of hardest temper, and never to come off or "settle." Horn of tough *untampered steel*, never to break or bend. *Only Anvil made in the United States fully warranted as above.*

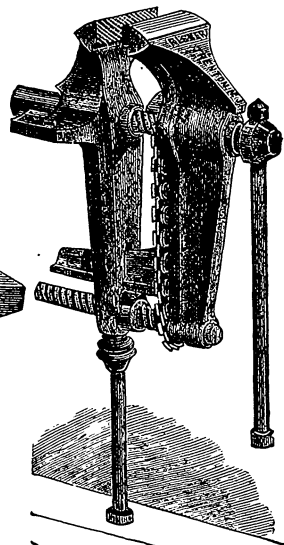
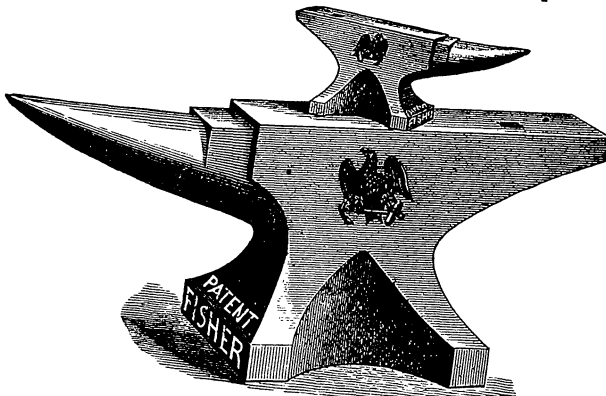
FISHER DOUBLE-SCREW VISE

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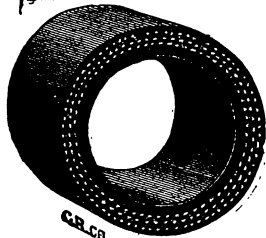


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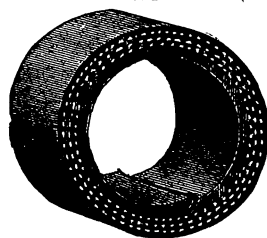
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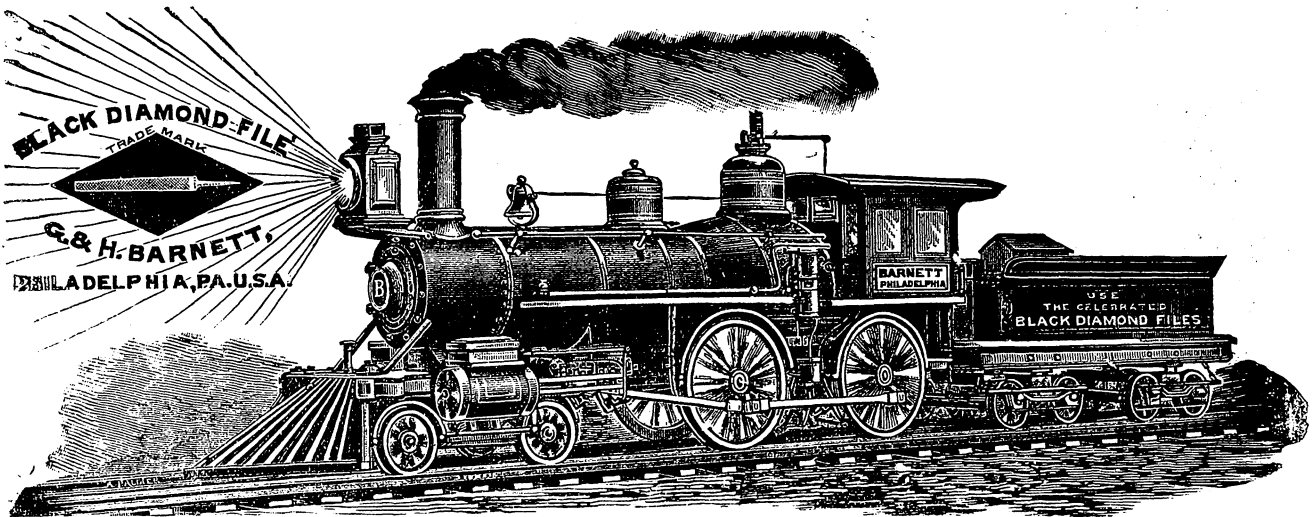
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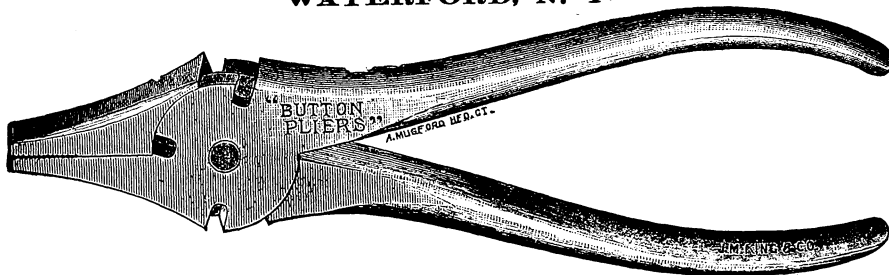
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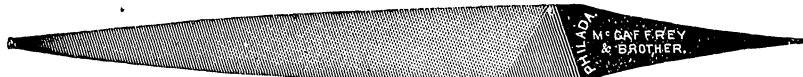
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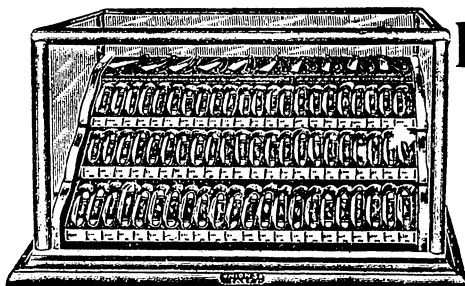
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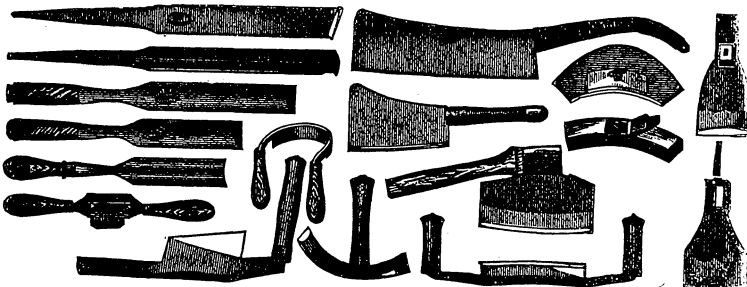
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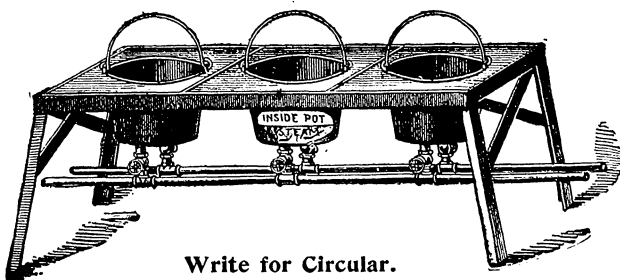
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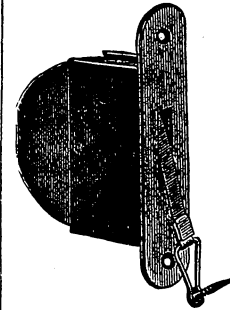
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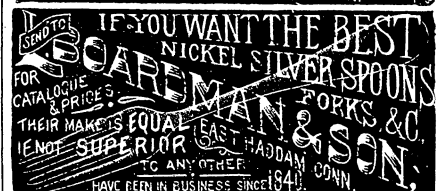
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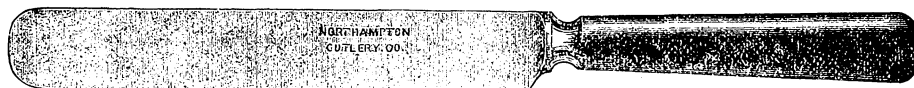


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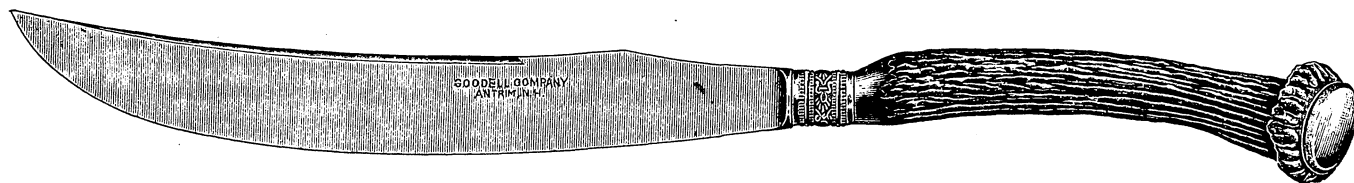
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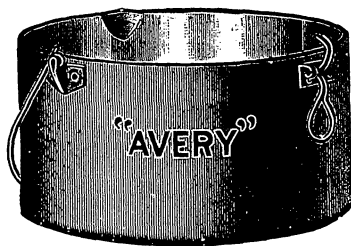
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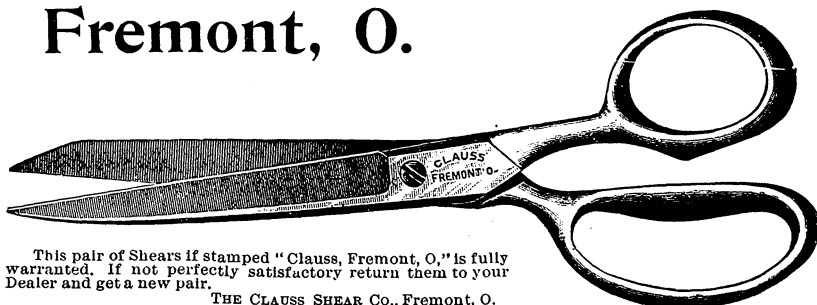


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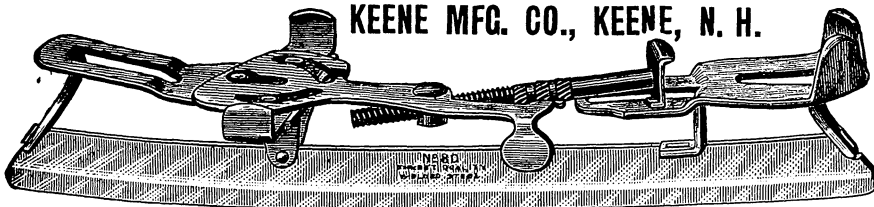
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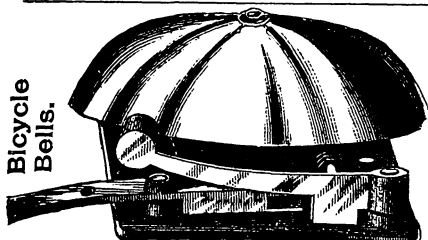
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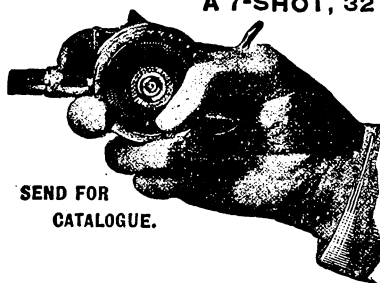
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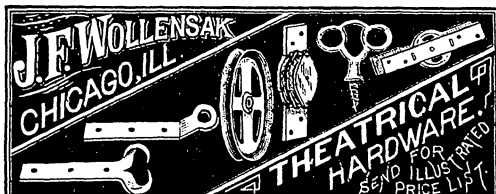
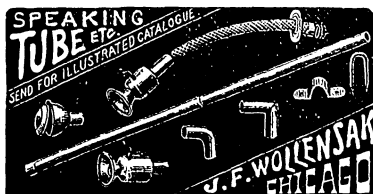
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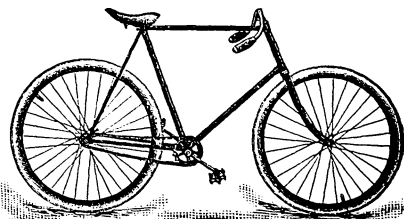
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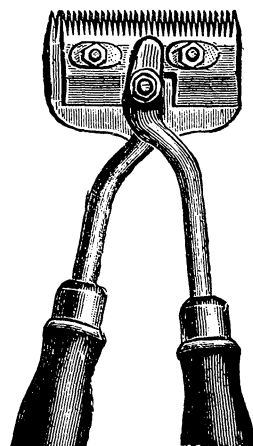
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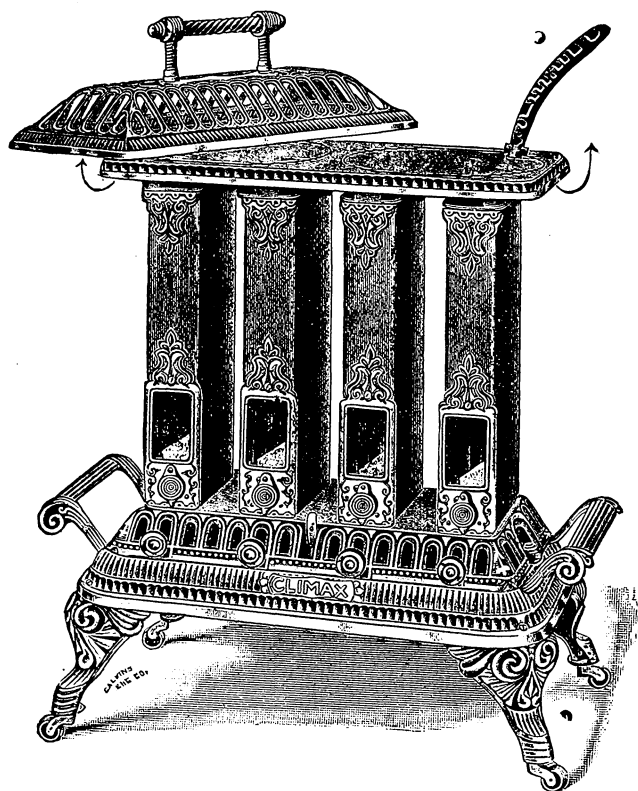
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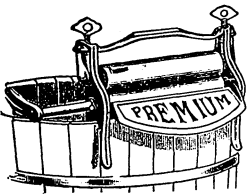
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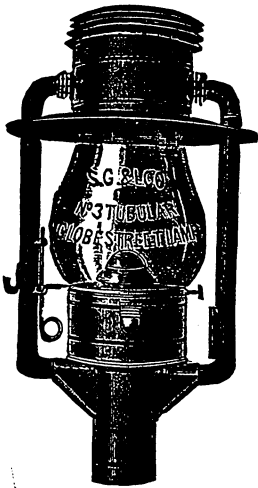
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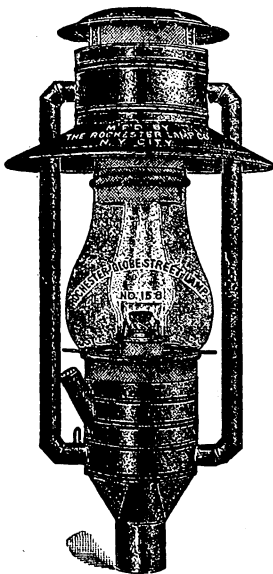
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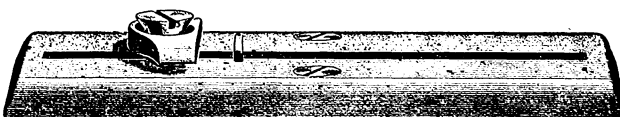
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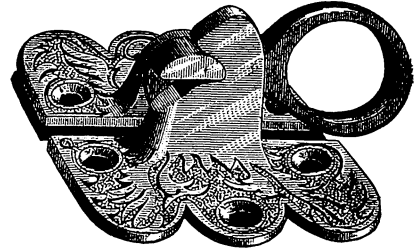
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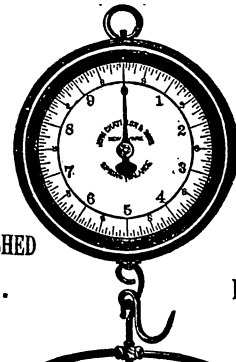
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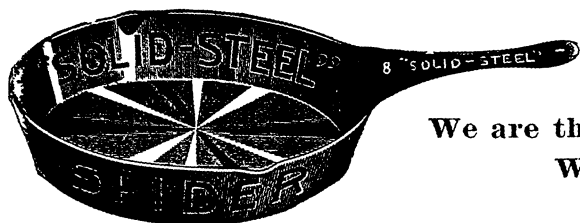


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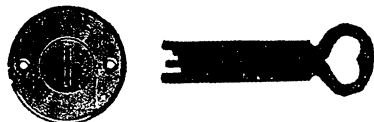
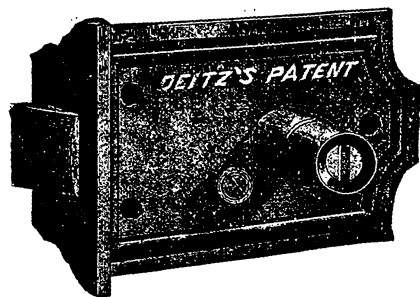


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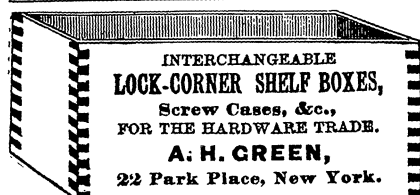
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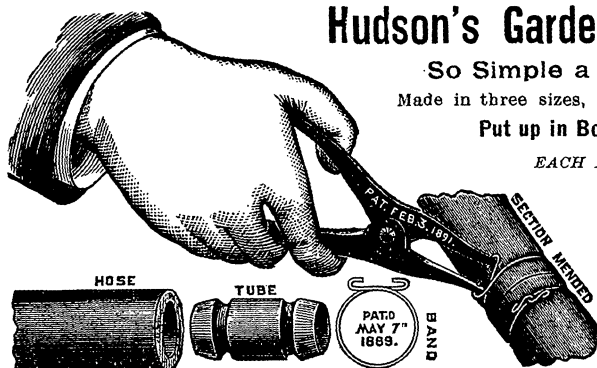
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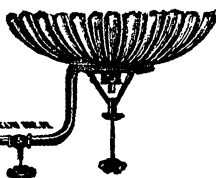
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They burn 150° Coal Oil, or 74° Naphtha, requiring a different burner for each.

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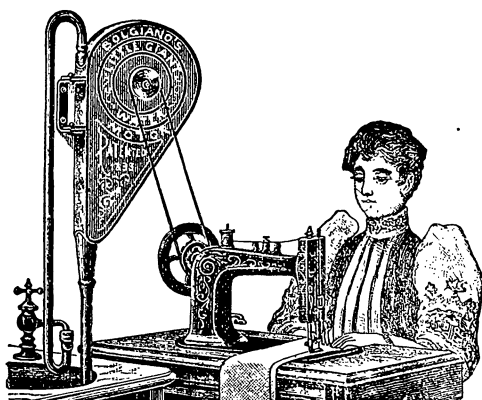
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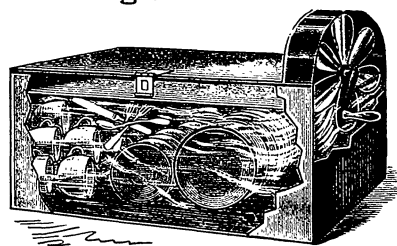
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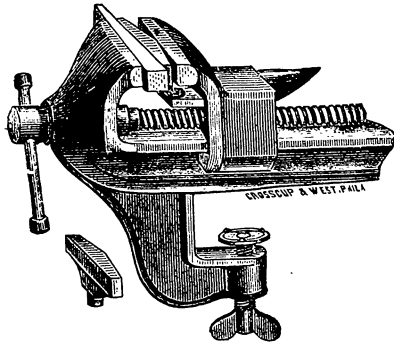
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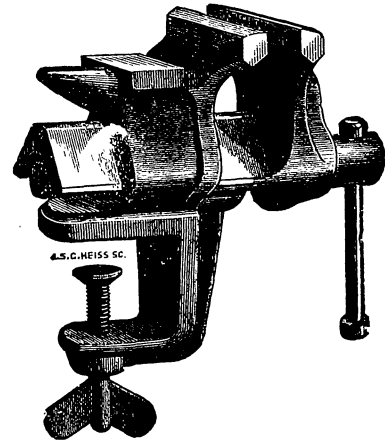
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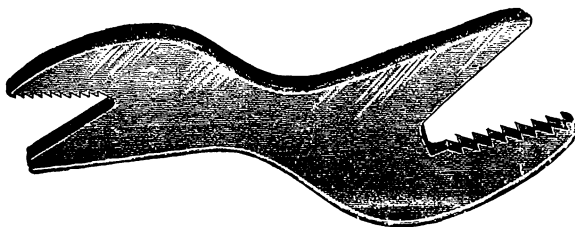
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Domestic, Nos. 5 and 7.



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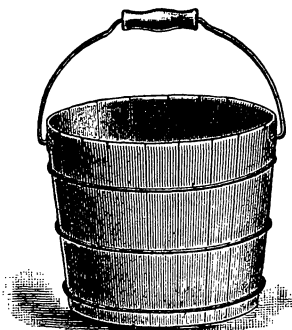
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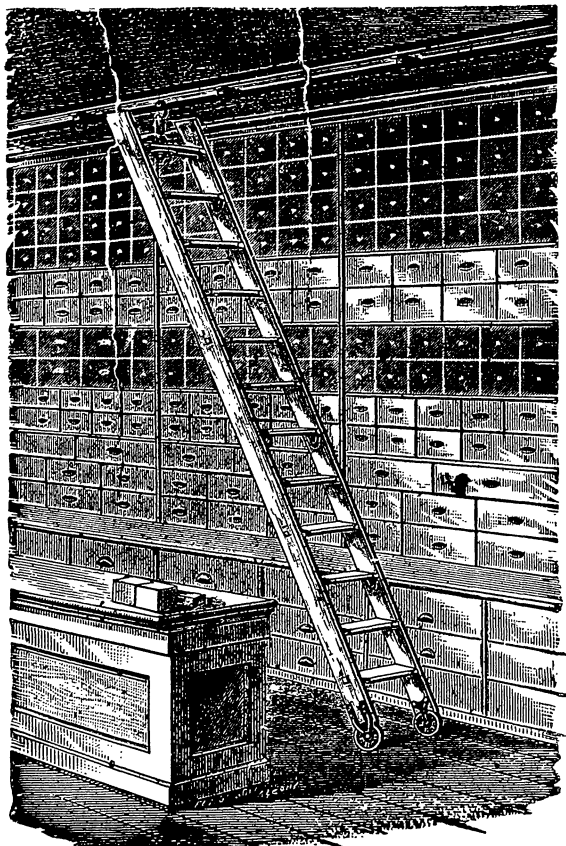
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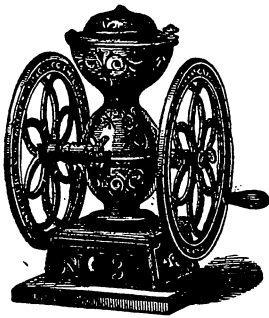
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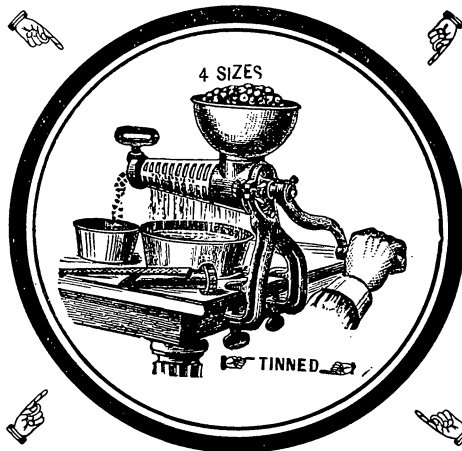
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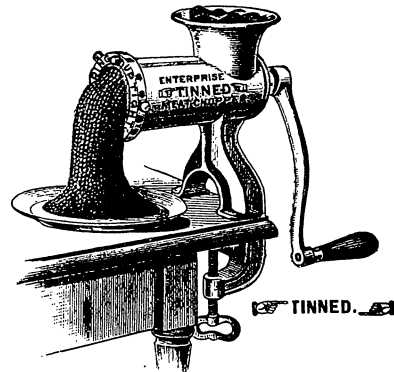
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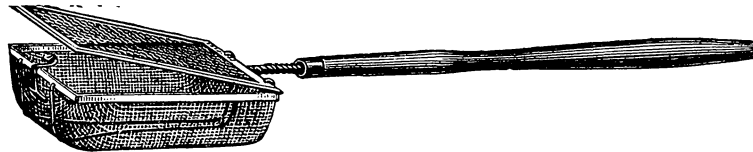
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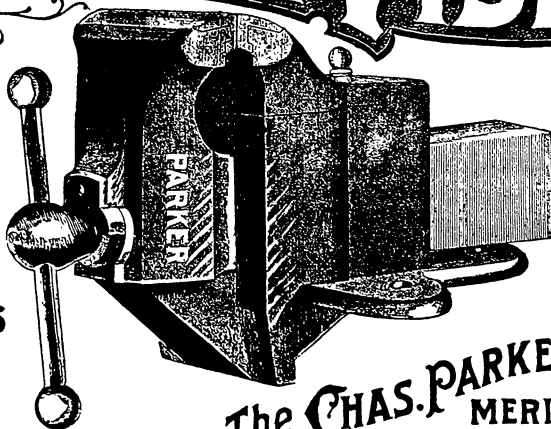
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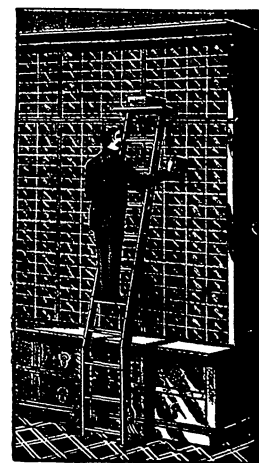


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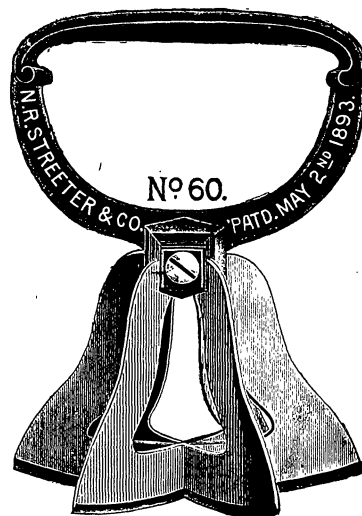
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Multiple-Bladed Means Rapid Cutting.

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BLADES can be **REMOVED** when they
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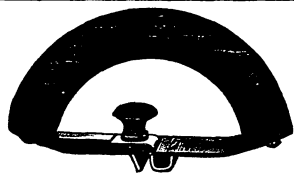
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FOR USE IN PRICE BOOKS.

Compiled by R. R. WILLIAMS, Hardware Editor of The Iron Age.

This pamphlet contains the principal standard Hardware price-lists in as clear and compact an arrangement as possible, so as to permit their being advantageously cut out and inserted in the price book. In order to make them adapted to this use they are printed on thin and tough paper of fine quality and on only one side of the paper.

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Pints.	Plain	Turned.	Tin'd or En'd.
1	\$0.30	.35	.39
1 1/2	.32	.37	.44
2	.35	.39	.48
3	.42	.47	.56
Quarts.			
2	.50	.58	.63
2 1/2	.53	.59	.68
3	.55	.62	.73
4	.60	.68	.84
5	.65	.75	.96
6	.70	.81	1.11
7	.75	.84	1.21
Gallons.			
2	.85	.96	1.31
2 1/2	1.05	1.18	1.56
3	1.20	1.35	1.70

The success of the effort to give the lists in small space is illustrated in many of the lists, in which a clear and condensed arrangement is secured. For instance, the wrench list occupies but 3 inches by 1/4 inch, while the list of Stove Hollow Ware, in very small space, gives the list prices on a large and important line of goods which often occupy several pages in catalogues. In several lists, such as Strap and T Hinges and Butts, a new arrangement is adopted, which is regarded as presenting these lists in a very convenient as well as condensed form.

As is obvious from the lists herewith reproduced, the shape and size of the different lists varies greatly, the aim being to give each list the smallest and most convenient arrangement possible. None of the lists are, however, more than 3 1/2 x 6 inches in size, very few of them being as large as this and most of them very much smaller. In use it is intended that they shall be trimmed closely before they are inserted in price books, when they may be attached either by one edge close to the hinge of the book, as will, perhaps, be most convenient with the larger lists, permitting the use of the entire page for memoranda, or the smaller lists may be pasted on the page in connection with the entries in regard to discounts, freights, &c. Many of the lists are so compact in arrangement as when thus inserted to leave ample room for recording quotations.

Wrenches. Standard List.

Inches.	6	8	10	12	15	18	21
Black...	\$9.00	\$10.00	\$12.00	\$14.00	\$24.00	\$30.00	\$36.00
Bright..	10.00	11.00	14.00	16.00	26.00	32.00	38.00

Stove Hollow Ware.

Pots, KETTLES, ETC. (CAST IRON.)	No.	6	7	8	9	10	11
Pots.....	\$0.65	.75	.85	1.00	1.25	1.75	
Kettles.....	.55	.65	.70	.85	1.00	1.40	
T Kettles.....	.75	.80	.90	1.00	1.25		
Spiders.....	.27	.30	.35	.40	.50	.60	
Griddles Round	.22	.25	.27	.30			
" Long..	.40	.50	.60	.75			

SCOTCH AND YANKEE BOWLS.

No.	1	2	3	4	5	6
Scotch Bowls..	\$0.35	.40	.45	.50	.60	.70
Yankee Bowls.	.35	.45	.55	.65	.75	.90

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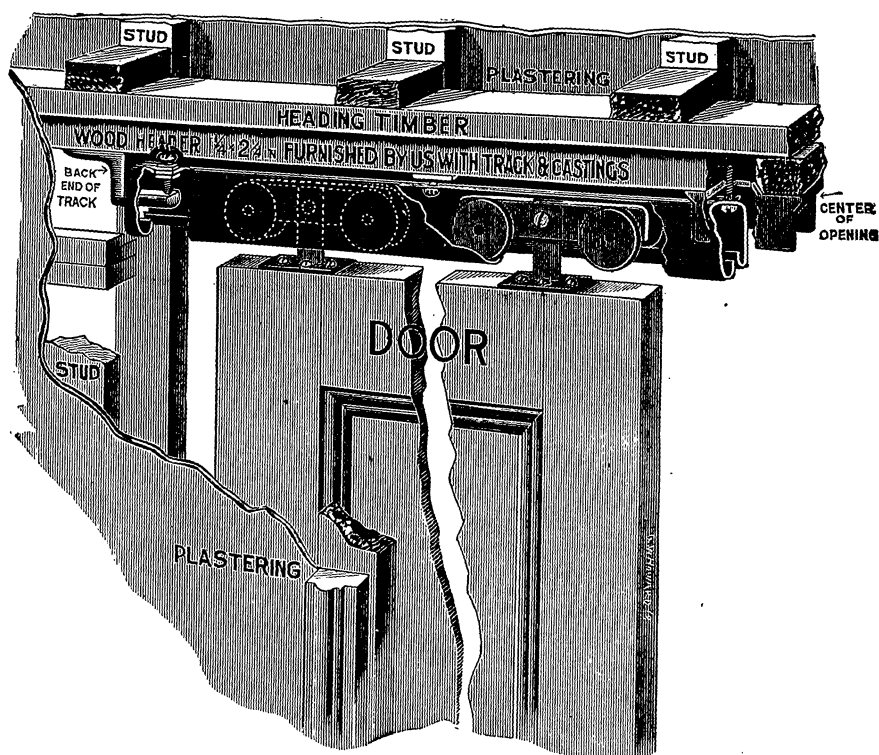
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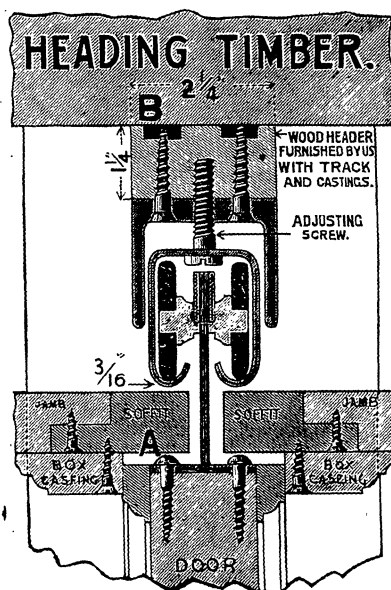
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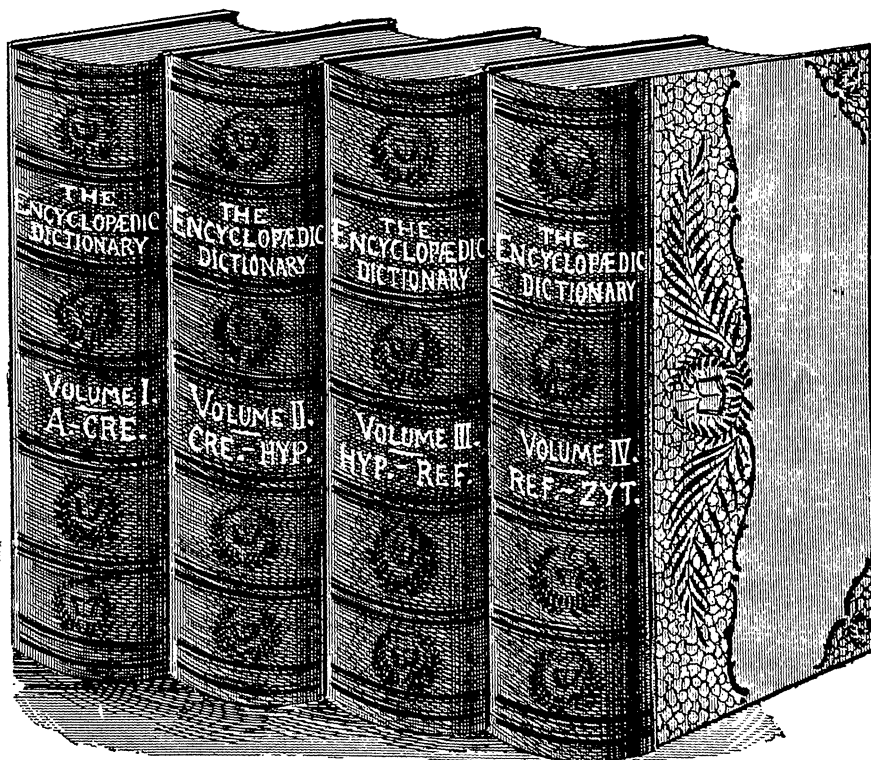
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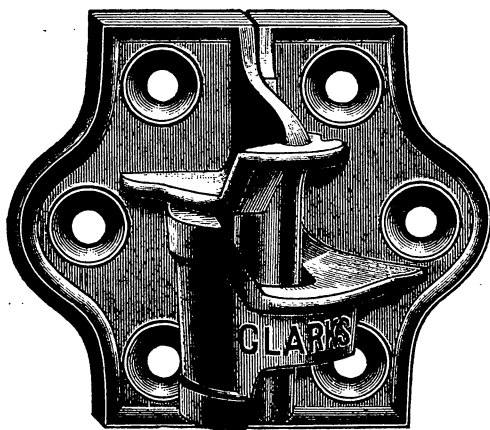
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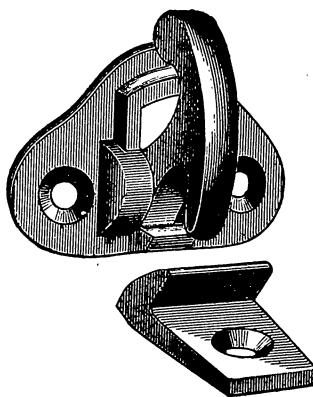
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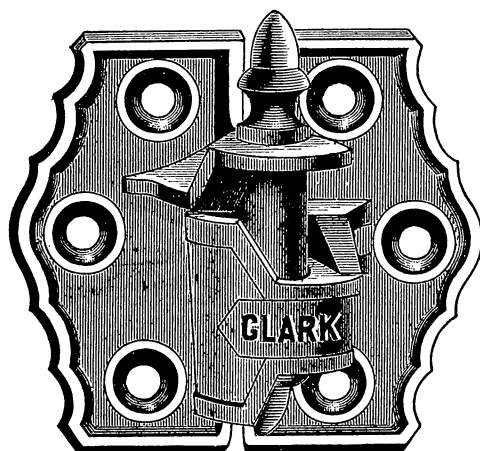
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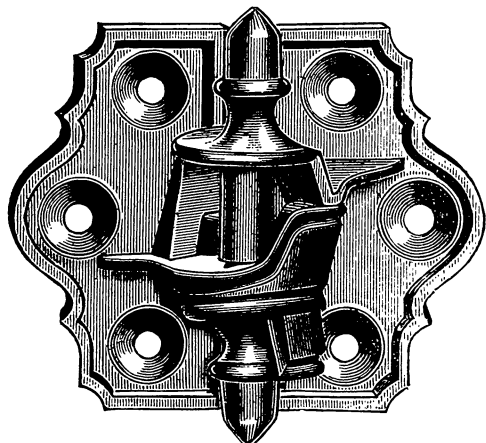


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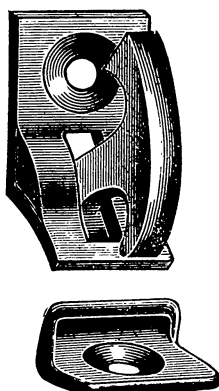


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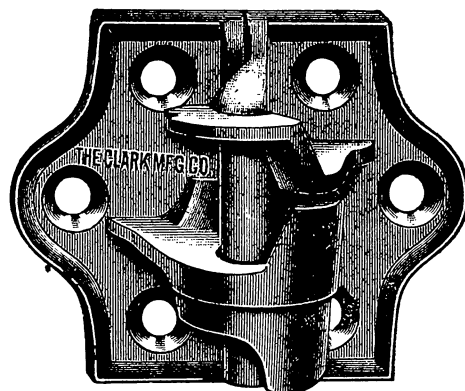
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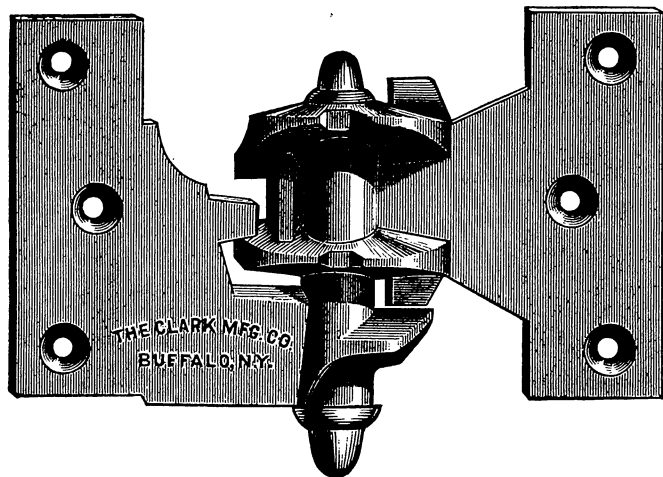
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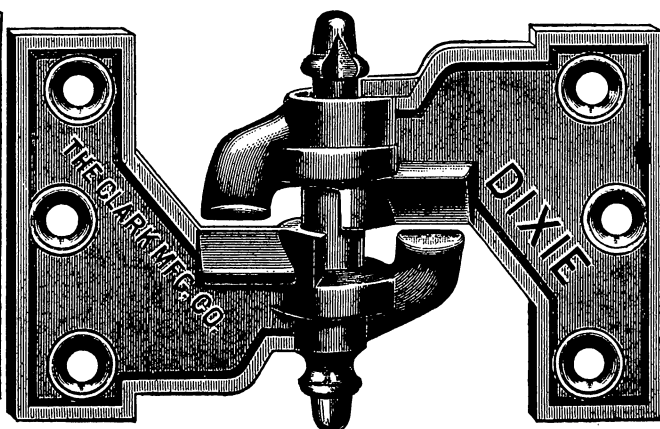
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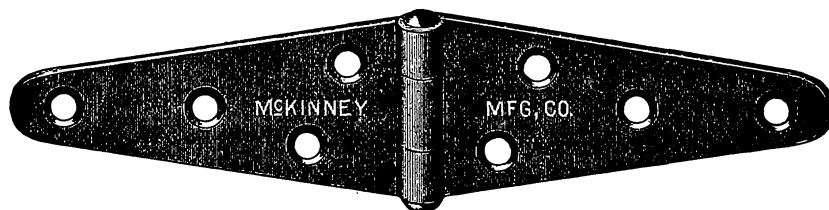
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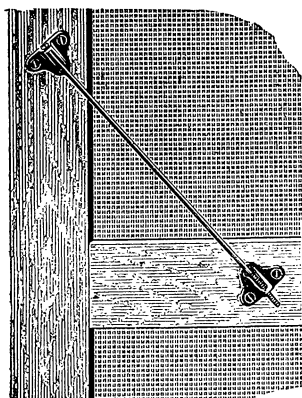


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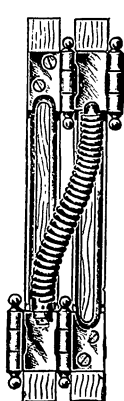
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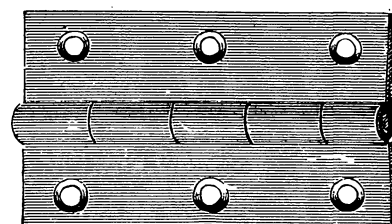
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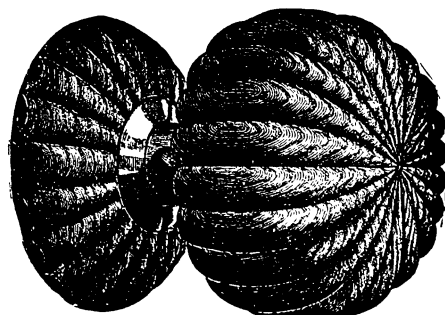
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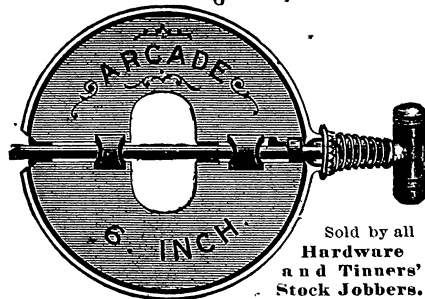


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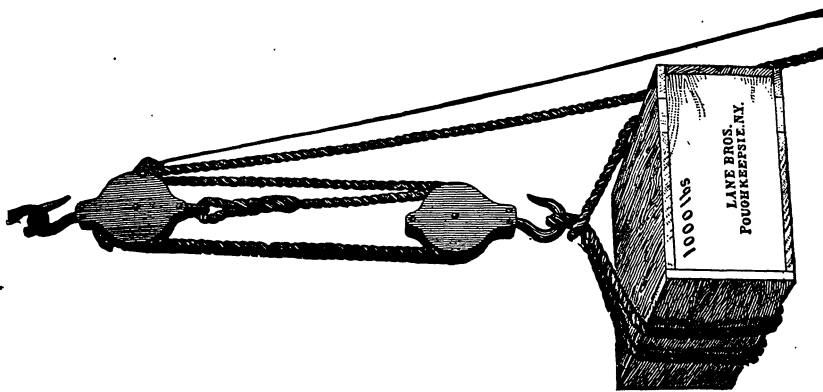
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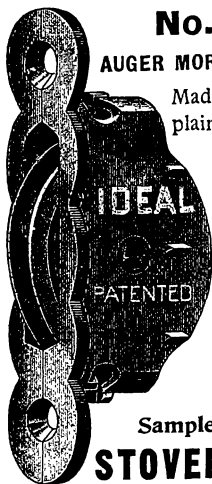
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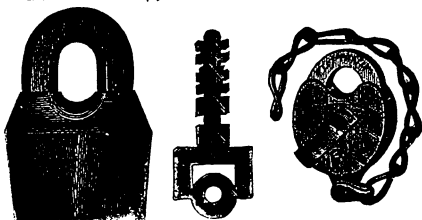
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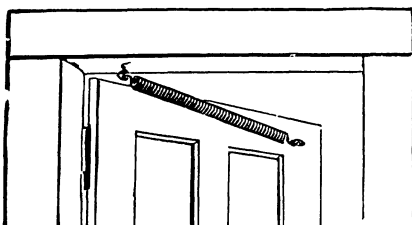
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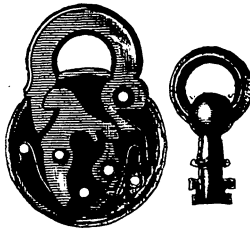


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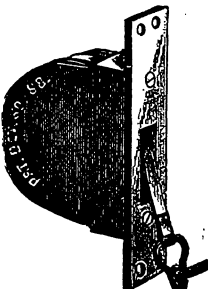
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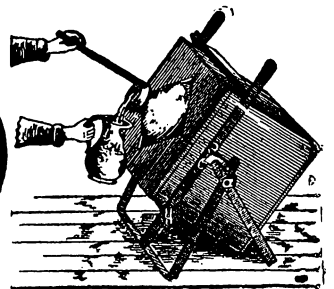
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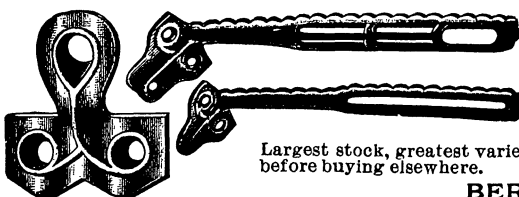
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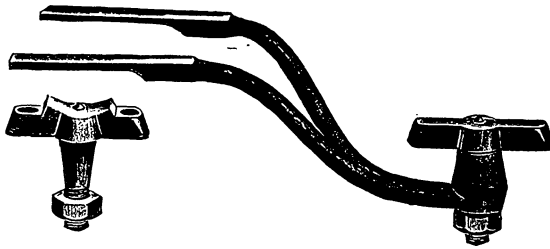


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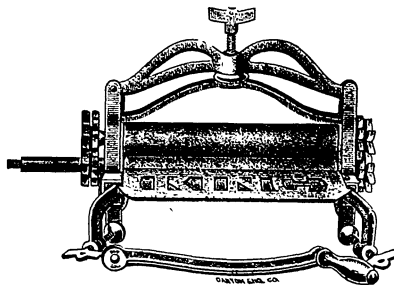
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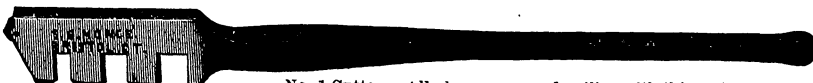
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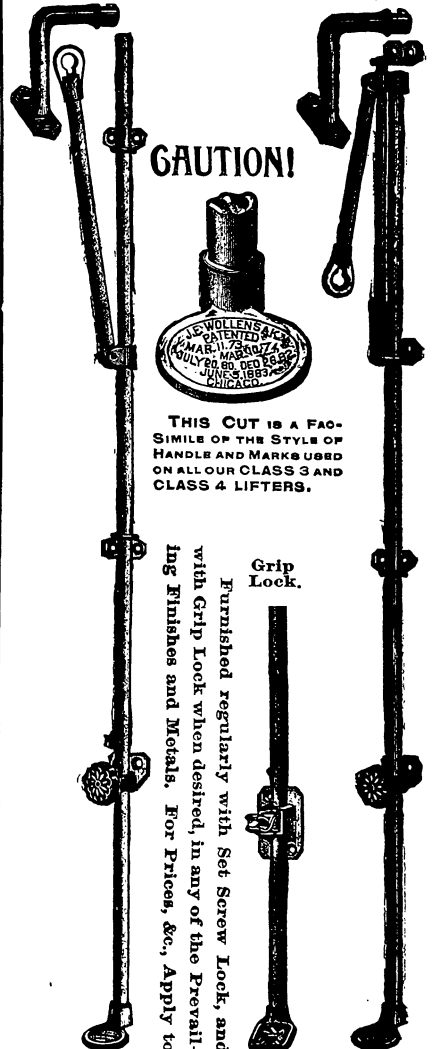
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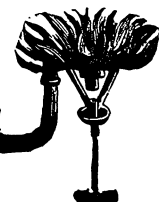
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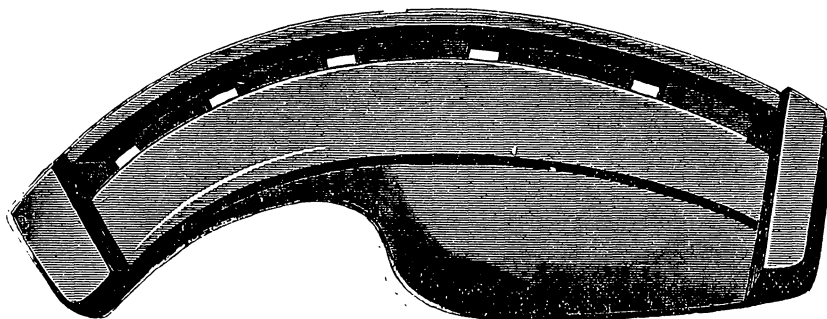
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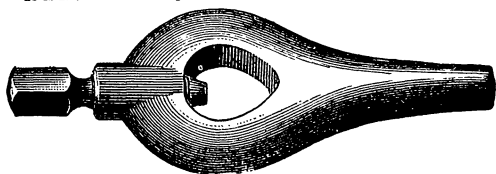
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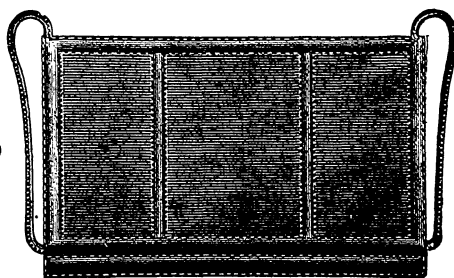
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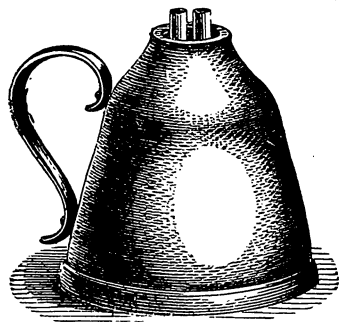
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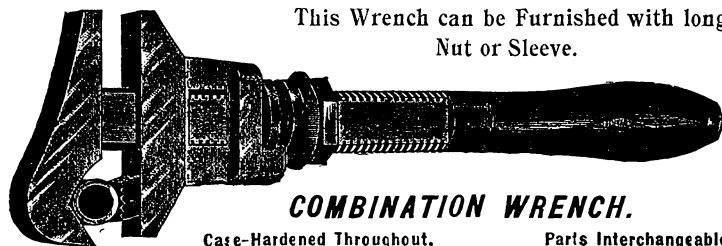
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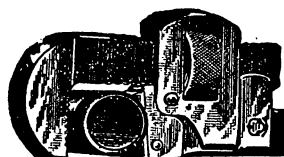
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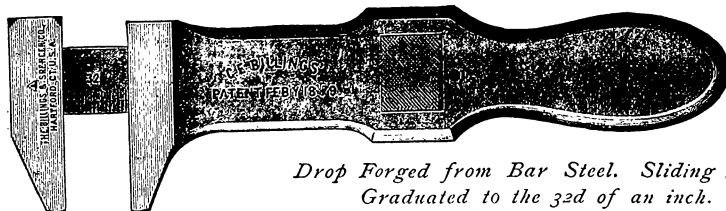
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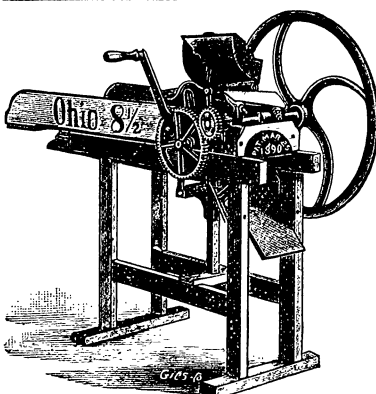
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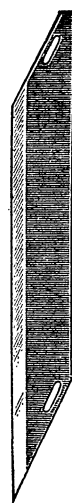
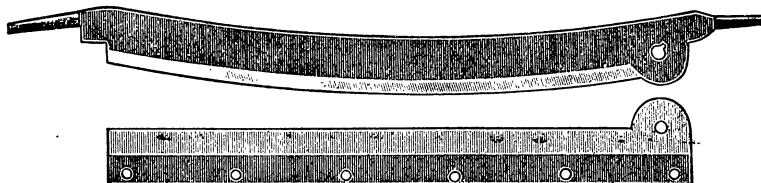
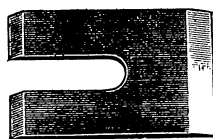
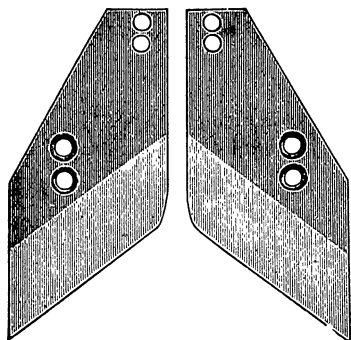
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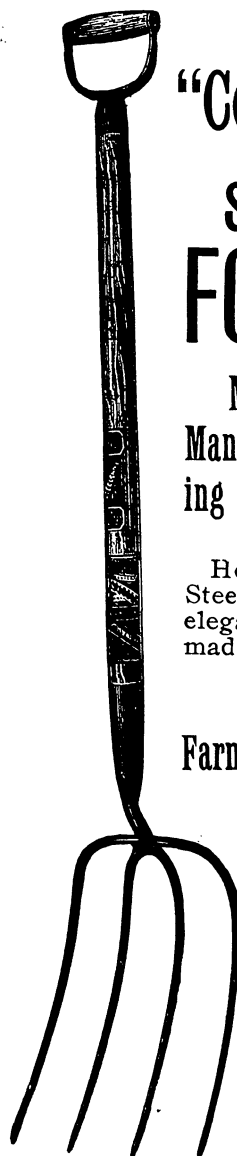
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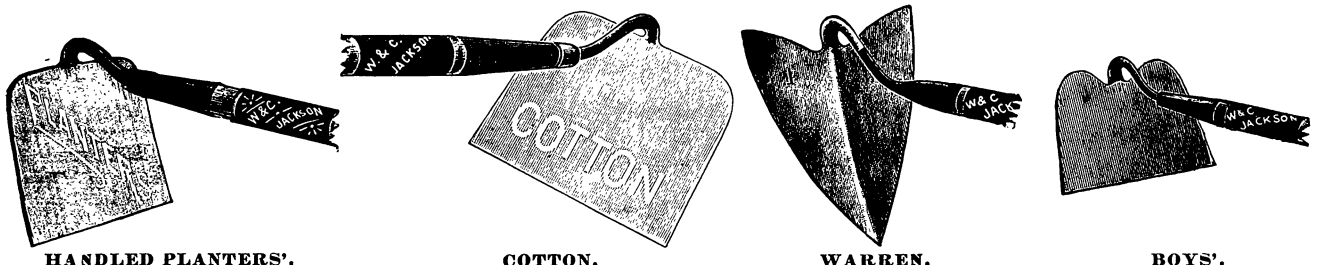
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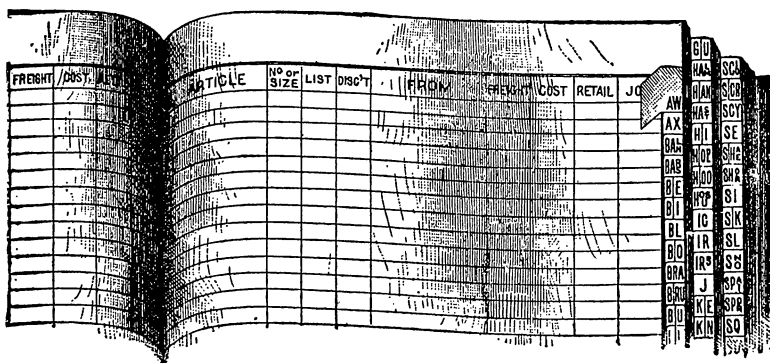
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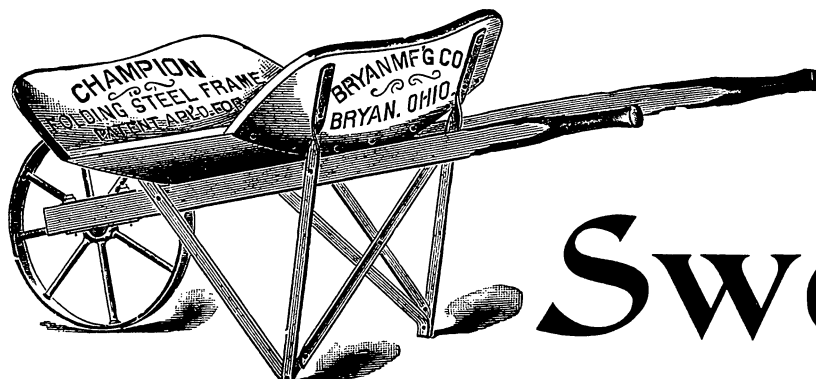
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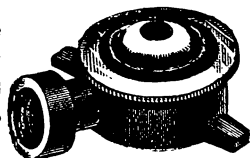


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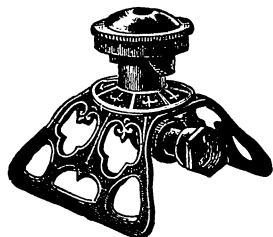
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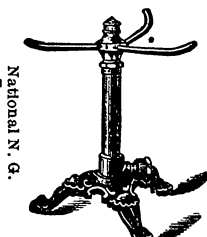


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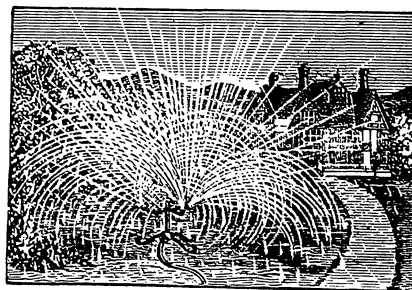


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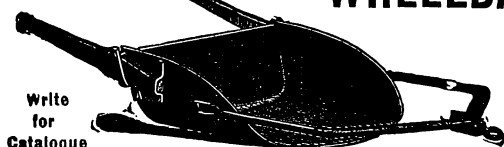
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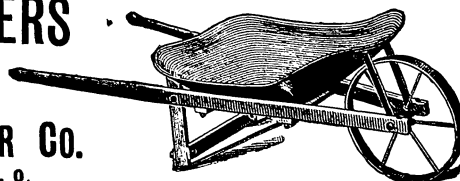
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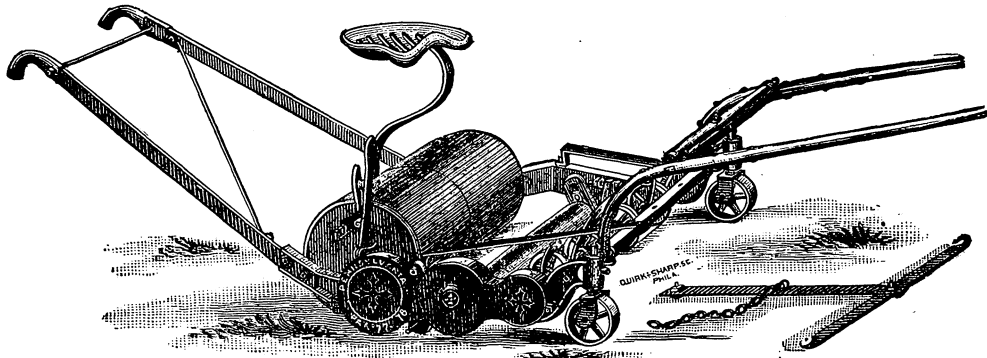


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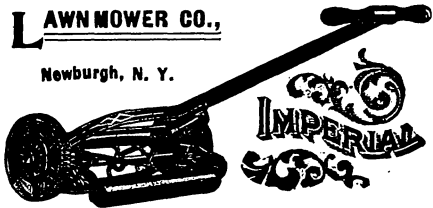


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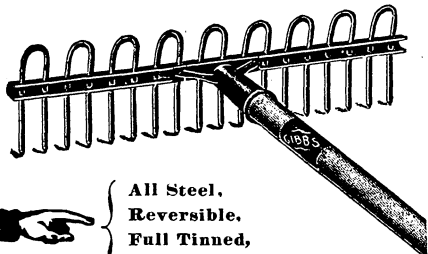


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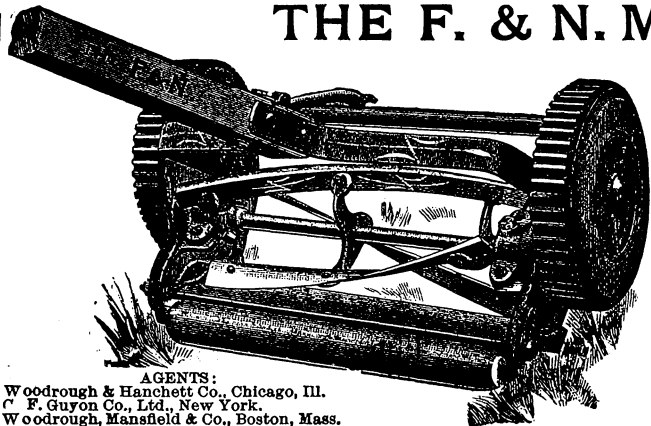
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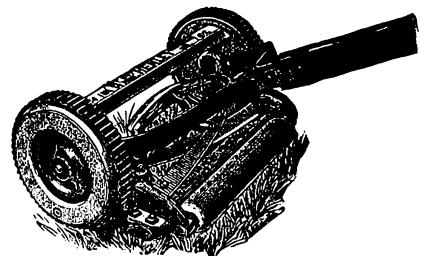
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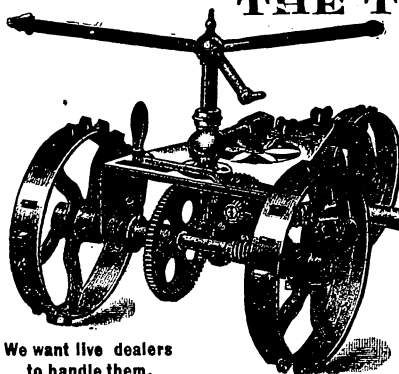
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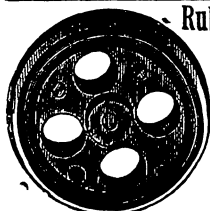
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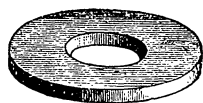
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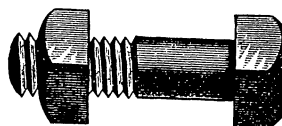
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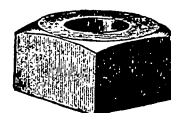
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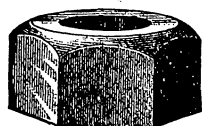
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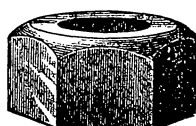
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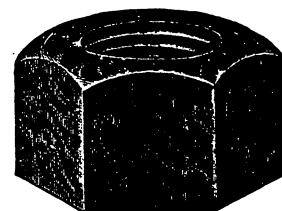
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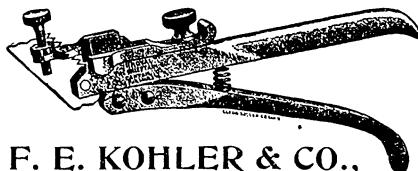
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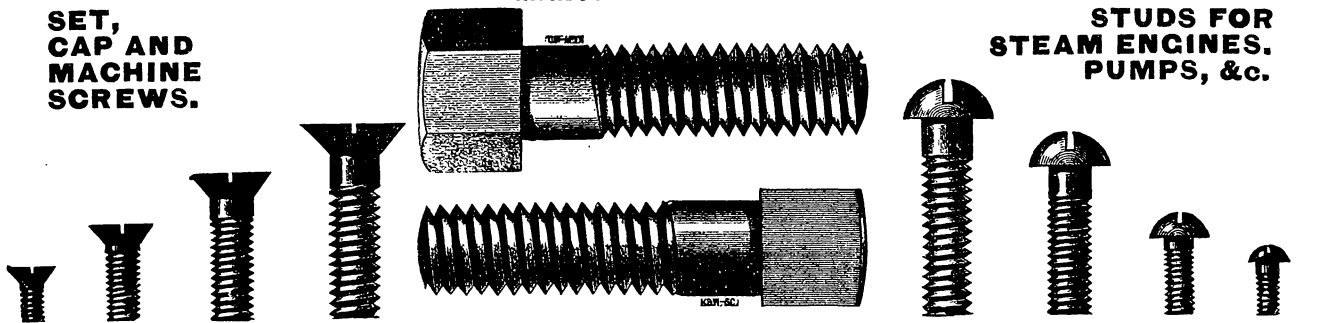
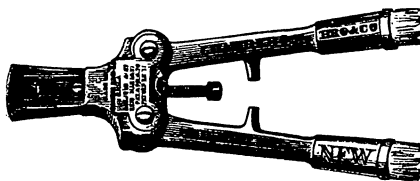
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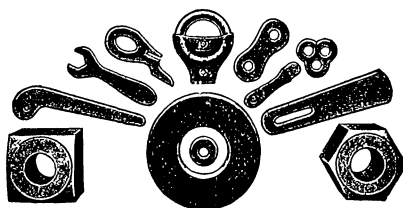
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Stuart & Peterson Co., Phila., Pa.

Grass Catchers.

Supplee Hardware Co., Phila., Pa.

Grate Guards.

Dow Wire Works Co., Louisville, Ky.

Grinding Mills.

Foss Mfg. Co., Springfield, O.

Grinding and Polishing Machines.

Cutter, Wood & Stevens, Boston, Mass.
Diamond Mach. Co., Providence, R. I.
Norton Emery Wheel Co., Worcester, Mass.

Grindstone Dressing Machinery.

Blake & Johnson, Waterbury, Conn.

Grindstones.

Cleveland Stone Co., Cleveland, O.

Gunpowder, Makers of.

Lafin & Rand Powder Co., 29 Murray St., N. Y.

Handles.

Cleveland Wood Turning Co., Cleveland, O.

Hangers, Door.

Chicago Spring Butt Co., Chicago, Ill.
Coburn Trolley Track Mfg. Co., Holyoke, Mass.
Lane Bros., Poughkeepsie, N. Y.

Hardware Comm'n Merchants.

Graham, John H. & Co., 111 Chambers St., New York.
Jacobus, W. H., 90 Chambers, N. Y.

Hardware Jobbers.

White, Van Glahn & Co., 15-17 Chatham Square, N. Y.

Hardware Manufacturers.

Stearns, E. C. & Co., Syracuse, N. Y.
Streeter, N. R. & Co., Groton, N. Y.
Union Mfg. Co., 103 Chambers, N. Y.
Yale & Towne Mfg. Co., Stamford, Conn.

Hardware Mfrs. Agents.

Bingham, W. Co., Cleveland, O.
Clarke, Thomas, St. John, N. B.
Graham, John H. & Co., 113 Chambers, Sickles, Sweet & Lyon, 35 Barclay, N. Y.

Hardware Specialties.

Acme Shear Co., Bridgeport, Conn.
Burger Bros., Philadelphia, Pa.
Clark Mfg. Co., Buffalo, N. Y.
Enterprise Mfg. Co., Philadelphia, Pa.
Ette & Henger Mfg. Co., St. Louis, Mo.
Johnson, S. C., Racine, Wis.
North Bros. Mfg. Co., Philadelphia, Pa.
Ranson Hdw. Co., Burlington Vt.
Scranton & Co., New Haven, Conn.
Union Lock & Hdw. Co., Lancaster, Pa.
Wilson, J. Fred., Worcester, Mass.
Wrightsville Hdw. Co., Wrightsville, Pa.

Harness Snaps.

Covert Mfg. Co., West Troy, N. Y.
Covert's Saddlery Wks., Farmer, N. Y.
Fitch, W. & E. T., New Haven, Conn.

Heaters, Oil and Gas.

Climax Mfg. Co., Chicago, Ill.

Hoes.

Withington & Cooley Mfg. Co., Jackson, Mich.

Hog Rings and Ringers.

Oakes & Irwin, Decatur, Ill.

Hoisting Machines.

Box, Alfred & Co., 314 Green, Phila.
Brown Hoisting & Conveying Mch. Co., Cleveland, Ohio.
Byers, Jno. F. Mch. Co., Ravenna, O.
Fulton Iron & Engine Wks., Detroit, Mich.
Harrington, E. & Son & Co., Phila.
Lane Bros., Poughkeepsie, N. Y.
Leary, Wm. Mfg. Co., 95 Liberty, N. Y.
Lincoln Iron Works, Rutland, Vt.
McCoy, Jos. F. & Co., 28 Warren St., Phila.
Marls & Beekley, Philadelphia.
Moore Mfg. & Fdy. Co., Milwaukee, Wis.
Morris, Williams & Co., Phila.
Sellers, Wm. & Co., Phila. and N. Y.
Spiegel, J. G., Reading, Pa.
Yale & Towne Mfg. Co., Stamford, Ct.

Hollow Ware.

Alvery Stamping Co., Cleveland, O.
Bronson Supply Co., Cleveland, Ohio.
Cleveland Stamping & Tool Co., Cleveland, O.
Stuart & Peterson Co., Phila., Pa.

Horse Nails, Makers of.

Capewell Horse Nail Co., Hartford, Conn.
National Horse Nail Co., Vergennes, Vt.
Putnam Nail Co., Neponset, Boston, Mass.

Horse and Mule Shoes, Makers of.

Bryden Horse Shoe Co., Catsauqua, Pa.
Burden Iron Co., Troy, N. Y.
Crescent Horse Shoe & Iron Co., Max Meadows, Va.
Diamond State Iron Co., Wilmington, Del.
Leonard, J., 446 West St., N. Y.
Old Dominion Iron & Nail Works Co., Richmond, Va.
Phoenix Horse Shoe Co., Poughkeepsie, N. Y.
Rhode Island Perkins Horse Shoe Co., Providence.
Shoenberger & Co., Pittsburgh, Pa.
Standard Horse Shoe Co., Boston, Mass.

Hose Menders.

Hudson, C. E. & Co., Leominster, Mass.

Hose.

Cleveland Rubber Works, Cleveland, O.
N. Y. Belding & Packing Co., Ltd., 15 Park Row, N. Y.

Husking Gloves.

Blair's Husking Gloves.

Hydrants, &c.

McLean, John, 298 & 298 Monroe, N. Y.

Hydraulic Forging.

U. S. Projectile Co., Brooklyn, N. Y.

Hydraulic Jacks.

Dudgeon, Richard, 24 Columbia, N. Y.
McCoy, Jos. F. Co., 28 Warren St., N. Y.

Ice Cream Freezers.

White Mountain Freezer Co., Nashua, N. H.

Injectors.

Rydon-Evans Mfg. Co., Philadelphia, Pa.

Insurance, Boiler.

Hartford Steam Boiler Inspection & Insurance Co., Hartford, Conn.

Iron and Steel, Swedish.

Lundberg, Gustaf, Boston, Mass.
Milne, A. & Co., 1 Broadway, N. Y.

Iron Commission Brokers.

Butze, Adolph, St. Louis, Mo.
Corning, Edw. & Co., 29 B'way, N. Y.
Cotton, Barclay W. & Co., Phila.
Etting, Edw. J., Philadelphia.
Hogan, John L. & Co., Philadelphia, Pa.
Hoffman, J. W. & Co., Philadelphia.
Levis, Henry & Co., Philadelphia.
Keeley, J. & Co., Philadelphia.
Lea, J. & Co., Philadelphia.
Mohr, J. J., 430 Walnut, Philadelphia.
Pilling & Crane, Philadelphia, Pa.
Wister, L. R. & Co., Phila., Pa.

Iron Ore.

Samuel, Frank, Philadelphia, Pa.

Iron, Merchants.

Barns, C. K. & Co., Philadelphia, Pa.
Borden & Lovell, 70 West, N. Y.
Bussenius & Cunliffe, Philadelphia.
Corning, Edw. & Co., 29 B'way, N. Y.
Cox, Justice, Jr., Philadelphia.
Cotton, Barclay W. & Co., Phila.
Hoffman, J. W. & Co., Philadelphia.
Leonard, J., 446 West St., N. Y.
Nicolls, Wheeler & Co., Philadelphia.
Ogden & Wallace, 577 to 583 Greenwich St., N. Y.
Pierson & Co., 29 Broadway, N. Y.
Thompson, W. H. & Co., Phila., Pa.
Wallace, Wm. & Co., 66 B'way, N. Y.
Whitney, R. & Co., 7 B'way, N. Y.
Wilson, E. H. & Co., Philadelphia.

Iron, Importers.

Abbott, Wheelock & Co., N. Y. and Boston.
Lundberg, Gustaf, Boston, Mass.

Iron, Sheet, Manufacturers of.

Cambridge Iron & Steel Co., Cambridge, Ohio.
W. Dewees Wood Co., Lim., McKeesport, Pa.

Ironwork, Ornamental.

Barnum, E. T., Detroit, Mich.
Champion Iron Co., Kenton, O.
Ludlow-Saylor Wire Co., St. Louis, Mo.
The Van Dorn Iron Works Co., Cleveland, O.

Keys.

Wollensak, J. F., Chicago, Ill.

Ladles.

Whiting Fdy. Equipment Co., Chicago, Ill.

Lanterns.

Rochester Lamp Co., 42 Park Place, New York.
Steam Gauge & Lantern Co., Syracuse, N. Y.

Lathes.

Beaman & Smith, Providence, R. I.
Dretz, Schumacher & Co., Cincinnati, O.
Draper Machine Tool Co., Worcester, Mass.
Harrington, E. Son & Co., Phila., Pa.
Johnson, Israel H., Jr., & Co., Philadelphia, Pa.
New Haven Mfg. Co., New Haven, Conn.
Sebastian Lathe Co., Cincinnati, O.
Seneca Falls Mfg. Co., Seneca Falls, N. Y.

Lathing, Expanded Metal.

Chess Bros., Pittsburgh, Pa.

Lathing, Wire.

Clinton Wire Cloth Co., Clinton, Mass.
N. J. Wire Cloth Co., Trenton, N. J.
Wright & Colton Wire Cloth Co., Worcester, Mass.

Lawn Mowers.

Blair Mfg. Co., Springfield, Mass.
Chadborn & Coldwell Mfg. Co., Newburg, N. Y.
Coldwell Lawn Mower Co., Newburg, N. Y.
F. & N. Mfg. Co., Richmond, Ind.
Henley, M. C., Richmond, Ind.
Supplee Hdw. Co., Phila., Pa.

Lawn Rakes.

Gibbs Mfg. Co., Canton, Ohio.
Kohler, F. E. & Co., Canton, O.

Lawn Sprinklers.

Blair Mfg. Co., Springfield, Mass.
Ette & Henger Mfg. Co., St. Louis, Mo.
McGowan, John H. Co., Cincinnati, O.
Portland Lawn Sprinkler Co., Portland, Me.

Letters and Figures, Metallic.

White, A. A. & Co., Providence, R. I.

Letters, Paper.

Tablet & Ticket Co., Chicago, Ill.

Levels.

Richardson, C. F. & Son, Athol, Mass.

Locks and Knobs, Manufacturers of.

Deltz, A. E., 97 Chambers, N. Y.
Reading Hdw. Co., Reading, Pa.
Smith & Egge Mfg. Co., Bridgeport, Conn.
Yale & Towne Mfg. Co., Stamford, Conn.

Lubricants.

Dixon, Jos., Crucible Co., Jersey City, N. J.

Machinery.

Am. Tool Works, Cleveland, Ohio.
Ayer, H. C. & Gleason Co., Phila., Pa.
Barnes, W. F. & John, Rockford, Ill.
Beaman & Smith, Providence, R. I.
Bement, Miles & Co., Philadelphia, Pa.
Bigelow, C. E., 45 Dev, N. Y.
Bisnall & Keeler Mfg. Co., St. Louis.
Bliss, E. W. Co., Brooklyn, N. Y.
Briggs, Marvin, 12 Broadway, N. Y.
Bulard Mch. Tool Co., Bridgeport, Conn.
Carlin's Sons, Thos., Allegheny, Pa.
Clapp, Geo. M., agt., 74 Cortlandt, N. Y.
Dietz & Harvey Mch. Co., Baltimore, Md.
Dietz, Schumacher & Co., Cincinnati, Ohio.
Fitchburg Mch. Works, Fitchburg, Mass.
Garvin Mch. Co., Lait & Canal Sts.
Gould & Eberhardt, Newark, N. J.
Hamilton Mch. Tool Co., Hamilton, O.
Harrington, E. Son & Co., Phila., Pa.
Henderer, A. L., Wilmington, Del.
Hendey Machine Co., Torrington, Ct.
Hill, Clarke & Co., Boston, Mass.
Howard & Morse, 45 Fulton St., N. Y.
Johnson, Israel H., Jr., & Co., Phila.
Jones & Lamson Mch. Co., Springfield, Vt.
Lodge & Davis Mch. Tool Co., Cincinnati, O.
Lodge & Shipley Mch. Tool Co., Cincinnati, O.
McCabe, J. J., 68 Cortlandt, N. Y.
Machinery's Supply Co., Rochester, N. Y.
Manville, E. J., Mch. Co., Waterbury, Conn.
Newark Mch. Tool Wks., Newark, N. J.
New Haven Mfg. Co., New Haven, Ct.
New York Machinery Depot, 178 Broadway, New York.
Niles Tool Wks., 138 Liberty St., N. Y.
Pittsburgh Mfg. Co., Pittsburgh, Pa.

- Place, Geo., 145 Broadway, N. Y.
 Poole, Robt. & Son Co., Baltimore, Md.
 Powell Planer Co., Worcester, Mass.
 Prentiss Tool & Supply Co., N. Y.
 Scranton Supply & Mchry. Co., Scranton, Pa.
 Selbert, J. M., Philadelphia, Pa.
 Sellers, Wm. & Co., Phila.
 Seyfert's Sons, L. F., Philadelphia, Pa.
 Sigourney Tool Co., Hartford, Conn.
 Steptoe, J. & Co., Cincinnati, O.
 Stow Flexible Shaft Co., Ltd., Phila.
 Toomey, Frank, Philadelphia, Pa.
 Walker Mfg. Co., Cleveland, O.
 Wetherill, Robert & Co., Chester, Pa.
 Wilson, W. A., Rochester, N. Y.
- Machinery for Hardware Manufacturers.**
 Adt, Jno. & Son, New Haven, Conn.
- Machine Knives.**
 Loring, Coes & Co., Worcester, Mass.
 Loyd, John, 558-562 Water St., N. Y.
 Simonds Mfg. Co., Fitchburg, Mass.
- Machine Screws.**
 Hubbell, Harvey, Bridgeport, Ct.
 Rhode Island Tool Co., Providence, R. I.
- Machine Tools.—See Machinery.**
- Machine Work.**
 Papping, J., 58th St. & 11th Ave., N. Y. City.
- Machinists' Scales.**
 Coffin & Leighton, Syracuse, N. Y.
 Starrett, L. S., Athol, Mass.
- Machinists' Tools and Supplies.**
 King, J. M. & Co., Waterford, N. Y.
 Sellers, Wm. & Co., Inc., Phila.
- Measuring Tapes.**
 Lufkin Rule Co., Saginaw, Mich.
- Meat Choppers.**
 Enterprise Mfg. Co., Philadelphia, Pa.
- Meat Cutters.**
 North Bros. Mfg. Co., Philadelphia, Pa.
- Mechanical Instruction.**
 Correspondence School of Mechanics, Scranton, Pa.
- Merry-go-round.**
 Clark, W. J. & Co., Salem, Ohio.
- Metals.**
 Fearing, Wm. S., 100 Chambers, N. Y.
 Hendricks Bros., 49 Cliff, N. Y.
- Metal Brokers.**
 American Metal Co., N. Y.
- Metalurgists.**
 Britton, J. Blodgett, Phila., Pa.
- Mincing Knives.**
 Palmer Hdw. Mfg. Co., Troy, N. Y.
 Streeter, N. R. & Co., Groton, N. Y.
- Mine Lamps.**
 Darby, Edw. & Sons, Phila., Pa.
 Leonard, B. E., Scranton, Pa.
- Mining Screens.**
 Harrington & King Perforating Co., Chicago, Ill.
 Howard & Morse, 45 Fulton, N. Y.
- Mining Machinery.**
 Allis, E. P. Co., Milwaukee, Wis.
- Models, Makers of.**
 Franklin, H. H. Mfg. Co., Syracuse, N. Y.
 Ideal Machine Works, Hartford, Conn.
- Molding Sand.**
 Obermayer, S. Co., Cincinnati, O.
- Motors, Water and Electric.**
 Bolgiano Mfg. Co., Baltimore, Md.
 C. & Electric Co., 402 and 404 Greenwich St., N. Y.
 Dallett, Thomas H. & Co., Phila., Pa.
- Nail Machinery.**
 Pittsburgh Mfg. Co., Pittsburgh, Pa.
- Nail and Nuck Pullers.**
 Am. Specialty Co., Hartford, Conn.
 Scranton & Co., New Haven, Conn.
- Nails (Cut) and Spikes.**
 Borden & Lovell, 70 West, N. Y.
 Pottstown Iron Co., Pottstown, Pa.
 Riverside Iron Wks., Wheeling, W. Va.
 Valley Steel Co., St. Louis, Mo.
- Nickel Plated Supplies.**
 Eddy Electric Mfg. Co., Windsor, Conn.
- Nickel Plating.**
 Rhodes, L. E. Co., Hartford, Conn.
- Norway Shapes, Rollers of.**
 Rowland, William & Harvey, Frankford, Philadelphia.
- Novelty Manufacturers.**
 Franklin, H. H. Mfg. Co., Syracuse, N. Y.
 Ideal Machine Works, Hartford, Conn.
- Nut Machines.**
 Dunham Nut Co., Unionville, Ct.
- Nuts, Bolts, &c., Makers of.**
 American Bolt Co., Lowell, Mass.
 American Screw Co., Providence, R. I.
 Blake & Johnson, Waterbury, Conn.
 Dunham Nut Co., Unionville, Conn.
 Haskell, Wm. H. Co., Pawtucket, R. I.
 Mt. Carmel Bolt Co., Mt. Carmel, Conn.
 Pennsylvania Bolt & Nut Co., Lebanon, Pa.
 Port Chester Bolt & Nut Co., Port Chester, N. Y.
 Rhode Island Tool Co., Providence, R. I.
 Russell, Burdall & Ward, Port Chester, N. Y.
 Sternbergh, J. H. & Son, Reading, Pa.
 Wilson, J. Fred., Worcester, Mass.
 Wm. H. Haskell Co., Pawtucket, R. I.
- Oilers.**
 Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.
- Oil Stones.**
 Pike Mfg. Co., Pike Station, N. H.
- Ores.**
 Wister, Francis, Philadelphia, Pa.
- Ox Shoes.**
 Millers Falls Co., 93 Reade St., N. Y.
 Scranton Forging Co., Scranton, Pa.
- Packing.**
 Morrison, Robert, St. Louis, Mo.
 N. Y. Belting & Packing Co., Ltd., N. Y.
- Padlocks.**
 Ames Sword Co., Chicopee, Mass.
 Fraim, E. T., Lancaster, Pa.
 Union Lock & Hdw. Co., Lancaster, Pa.
 Wolf, W. & L., Phila., Pa.
- Pails.**
 Richmond Cedar Wks., Richmond, Va.
- Paint.**
 Garry Iron & Steel Roofing Co., Cleveland, O.
- Paint Burners.**
 Dangler Stove & Mfg. Co., Cleveland, Ohio.
- Paint Cans.**
 Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.
- Pants Stretcher.**
 Covert Mfg. Co., West Troy, N. Y.
- Patent Solicitors.**
 Butler, C. N., Phila., Pa.
 Jenner, H. W. T., Washington, D. C.
 Howson & Howson, Philadelphia and Washington.
 Stocking, E. B., Washington, D. C.
- Pattern Letters.**
 Wells, Heber, 157 William St., N. Y.
- Perforated Metal.**
 Clinton Wire Cloth Co., Clinton, Mass.
 Harrington & King Perforating Co., Chicago, Ill.
 Hendrick Mfg. Co., Ltd., Carbondale, Pa.
- Phosphor Bronze.**
 Phosphor Bronze Smelting Co., Limited, Philadelphia.
- Phosphor Tin.**
 Crescent Phosphorized Metal Co., Philadelphia, Pa.
 Halk & Naumann, 516 Pearl, N. Y.
- Picks and Mattocks.**
 Plumb, Fayette R., Philadelphia, Pa.
- Pig Iron.**
 Houston, C. B. & Co., Philadelphia, Pa.
 Montour Iron & Steel Co., Danville, Pa.
 Naylor & Co., 45 Wall, N. Y.
 Pilling & Crane, Philadelphia, Pa.
 Samuel, Frank, Philadelphia, Pa.
- Pig Iron Storage.**
 Am. Pig Iron Storage Warrant Co., 44 Wall, N. Y.
- Pile Drivers.**
 Vulcan Iron Works, Chicago, Ill.
- Pipe, Bent.**
 National Pipe Bending Co., New Haven, Conn.
- Pipe Cutting and Threading Machines.**
 Armstrong Mfg. Co., Bridgeport, Conn.
 Bignall & Keeler Mfg. Co., St. Louis, Mo.
 Detrick & Harvey Mch. Co., Baltimore, Md.
 Merrill Mfg. Co., Toledo, O.
 Pancoast, Henry B. & Co., Phila.
 Saunders' Sons, D., Yonkers, N. Y.
 Walworth Mfg. Co., Boston, Mass.
- Pipe Grips.**
 Prentiss Vise Co., 44 Barclay, N. Y.
- Pipes, Fittings, &c., Makers of.**
 McNab & Harlin Mfg. Co., N. Y.
- Pipe, Water and Gas, Makers of.**
 Donaldson Iron Co., Emaus, Pa.
 Riverside Iron Works, Wheeling, W. Va.
 Wood, R. D. & Co., Philadelphia, Pa.
- Plane Irons, Manufacturers of.**
 Buck Bros., Millbury, Mass.
 Buck, Chas., Millbury, Mass.
- Planers.**
 Detrick & Harvey Mch. Co., Baltimore, Md.
 New Haven Mfg. Co., New Haven, Conn.
 Powell Planer Co., Worcester, Mass.
 Wilson, W. A., Worcester, Mass.
- Planes, Manufacturers of.**
 Stanley Rule & Level Co., N. Y.
- Plated Ware.**
 Boardman, L. & Son, New Haddam, Ct.
 Holmes & Edwards Silver Co., Bridgeport, Conn.
 Rogers, Wm. Mfg. Co., Hartford, Ct.
- Plate, Iron and Steel, Mfrs. of.**
 Aetna-Standard Iron & Steel Co., Bridgeport, O.
 Lukens Iron & Steel Co., Coatesville, Pa.
 Mahoning Valley Iron Co., Youngstown, Ohio.
 Moorhead-McLean Co., Pittsburgh, Pa.
 McIlvain & Sons, Reading, Pa.
 Pottstown Iron Co., Pottstown, Pa.
 Pottsville Iron & Steel Co., Pottsville, Pa.
 Singer, Nimick & Co., Pittsburgh, Pa.
 The Mahoning Valley Iron Co., Youngstown, O.
 Wood, Alan Co., Philadelphia.
- Plating, Nickel, Brass and Silver.**
 Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.
- Polishing Machines.**
 Watson & Stillman, 204 E. 43d, N. Y.
- Post Hole Diggers.**
 Gibbs Mfg. Co., Canton, Ohio.
 Kohler, F. E. & Co., Canton, O.
- Poultry Nettings.**
 Barnum, E. T., Detroit, Mich.
 Gilbert & Bennett Mfg. Co., 42 Cliff St., N. Y.
 N. J. Wire Cloth Co., Trenton, N. J.
 "Silver Finish."
 Tyler Wire Works Co., W. S., Cleveland, O.
 Wright & Colton Wire Cloth Co., Worcester, Mass.
- Powder.**
 Lafin & Rand Powder Co., 29 Murray.
 New York Powder Co., 62 Liberty St., N. Y.
- Power Hammers.**
 Dienelt & Eisenhardt, Philadelphia.
 Dupont Mfg. Co., St. Johnsbury, Vt.
 Jenkins & Lingle, Bellefonte, Pa.
 Miner & Peck Mfg. Co., New Haven, Conn.
 Scranton & Co., New Haven, Conn.
- Power Transmitting Machinery.**
 Dodge Mfg. Co., Mishawaka, Ind.
- Presses, Dies, &c.**
 E. W. Bliss Co., Brooklyn, N. Y.
 Crosby, G. A. & Co., Chicago, Ill.
 Stiles & Parker Press Co., Brooklyn, N. Y.
 Waterbury Mch. Co., Waterbury Ct.
- Presses, Power, Makers of.**
 Bliss, E. W. Co., Brooklyn, N. Y.
 Manville, E. J. Mch. Co., Waterbury, Ct.
 Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.
- Pulleys.**
 Brown, A. & F., 17 Dey St., N. Y.
 Dodge Mfg. Co., Mishawaka, Ind.
 Keystone Clutch Mch. Wks., Phila., Pa.
- Pulverizing Mills.**
 Bradley Pulverizer Co., Boston, Mass.
- Pumping Machinery.**
 Dean Bros. Steam Pump Works, Indianapolis, Ind.
 Goulds Mfg. Co., Seneca Falls, N. Y.
 Hooker-Colville Steam Pump Co., St. Louis, Mo.
 McGowan, J. H. & Co., Cincinnati, O.
 Martin, J. & Son, Jersey City, N. J.
 Norwalk Iron Works Co., So. Norwalk, Conn.
 Southwark Fdy. & Mch. Co., Phila., Pa.
 Valley Pump Works, Easthampton, Mass.
 Worthington, Henry R., 86 and 88 Liberty St., N. Y.
- Pumps, Makers of.**
 Deming Co., Salem, O.
 Douglas, W. & B., Middletown, Conn.
 Goulds Mfg. Co., Seneca Falls, N. Y.
 Miller, C. & Sons, Utica, N. Y.
 Myers, F. E. & Bro., Ashland, O.
 Peter Pump Co., Kewanee, Ill.
 Red Jacket Mfg. Co., Davenport, Iowa.
- Punches.**
 Richards, I. P., Providence, R. I.
- Punches and Shears, Hand and Power.**
 E. W. Bliss Co., Brooklyn, N. Y.
 Crosby, G. A. & Co., Chicago, Ill.
 Hender, A. L., Wilmington, Del.
 Stiles & Parker Press Co., Brooklyn, N. Y.
 Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.
 Watson & Stillman, 204 E. 43d, N. Y.
- Rails, Old and New.**
 Perry, W. H. & Co., Providence, R. I.
- Rat and Mouse Traps.**
 Burditt & Williams, Boston, Mass.
 Estey, W. S., 65 Fulton, N. Y.
 Excelsior Cutlery Co., Worcester, Mass.
- Reels.**
 Hendryx, A. B. Co., New Haven, Conn.
- Refrigerator Door Fasteners.**
 Conroy, P. J. & Co., Philadelphia.
- Rivets.**
 Blake & Johnson, Waterbury, Conn.
 Burden Iron Co., Troy, N. Y.
 Clark & Cowles, Plainville, Conn.
 Cobb & Drew, Plymouth, Mass.
 Sternbergh, J. H. & Son, Reading, Pa.
 Townsend, W. P. & Co., New Brighton, Pa.
- Riveting Machines.**
 Adt, Jno. & Sons, New Haven, Conn.
- Rolling Mill Machinery.**
 Birmingham Iron Fdry, Birmingham, Conn.
 Booth, The Lloyd Co., Youngstown, O.
 Leeburg Foundry & Mch. Co., Pittsburgh, Pa.
 Morgan Construction Co., Worcester, Mass.
 Robinson-Rea Mfg. Co., Pittsburgh, Pa.
 Totten & Hogg Iron and Steel Fdry Co., Pittsburgh, Pa.
 Trethewey Mfg. Co., Pittsburgh, Pa.
 Waterbury Farrel Foundry & Mch. Co., Waterbury Conn.
- Rolls, Chilled, Sand and Steel.**
 Birmingham Iron Foundry, Birmingham, C. nn.
 Booth, The Lloyd Co., Youngstown, O.
 East Chicago Fdy Co., Chicago, Ill.
 Garrison, A. Fdy. Co., Pittsburgh, Pa.
 Robinson-Rea Mfg. Co., Pittsburgh, Pa.
 Seaman, Sleeth & Black, Pittsburgh.
 Totten & Hogg Iron and Steel Fdry Co., Pittsburgh, Pa.
- Roofing.**
 Berlin Iron Bridge Co., E. Berlin, Conn.
 Cincinnati Corrugating Co., Piqua, O.
 N. Y. Iron Roofing & Corrugating Co., Jersey City, N. J.
- Rope and Web Goods.**
 Covert Mfg. Co., West Troy, N. Y.
 Covert's Saddlery Wks., Farmer, N. Y.
- Rope Wheels.**
 Cresson, Geo. V. Co., Philadelphia, Pa.
- Rubber Goods.**
 Canfield, H. O., Bridgeport, Conn.
- Rules, Manufacturers of.**
 Stanley Rule & Level Co., 29 Chambers.
- Rust Preventive.**
 Bridgeport Gun Implement Co., 313-315 Broadway, N. Y.
- Sad Irons.**
 Enterprise Mfg. Co., Phila., Pa.
 Streeter, N. R. & Co., Groton, N. Y.
- Sad Irons, Gas.**
 Bolgiano Mfg. Co., Baltimore, Md.
- Sand Paper.**
 Baeder, Adamson & Co., Phila., Pa.
- Sash Balances.**
 Caldwell Mfg. Co., Rochester, N. Y.
 Pullman Sash Balance Co., Rochester, N. Y.
- Sash Cords and Chains.**
 Morton, Thos., 45 Elizabeth, N. Y.
 Ossawan Mills Co., Norwich, Conn.
 Samson Cordage Works, Boston, Mass.
 Smith & Egge Mfg. Co., Bridgeport.
- Sash Pulleys.**
 Palmer Hardware Mfg. Co., Troy, N. Y.
- Sash Weights.**
 Brown, E. E., & Co., Philadelphia, Pa.
 Norton Bros., Chicago, Ill.
- Saw Filing Machines.**
 Disston, Henry & Sons, Philadelphia, Pa.
- Saws, Makers of.**
 Atkins, E. C. & Co., Indianapolis, Ind.
 Disston, Henry & Sons, Phila., Pa.
 National Saw Co., 96 Reade St., N. Y.
 Simonds Mfg. Co., Fitchburg, Mass.
- Saw Vises.**
 Seneca Falls Mfg. Co., Seneca Falls, N. Y.
- Saw Sets.**
 Taintor Mfg. Co., 84-86 Chambers, N. Y.
- Scales, Manufacturers of.**
 Buffalo Scale Co., Buffalo, N. Y.
 Chatillon, John & Sons, 85-89 Cliff, N. Y.
- Scrapers, Road.**
 Am. Steel Scraper Co., Sydney, Ohio.
 Sidney Steel Scraper Co., Sydney, O.
- Screen Door Braces.**
 Clark, W. J. & Co., Salem, Ohio.
- Screens, Coal and Ore.**
 Hendrick Mfg. Co., Ltd., Carbondale, Pa.
- Screw Cutting Machinery.**
 Wells Bros. & Co., Greenfield, Mass.
 Wiley & Russell Mfg. Co., Greenfield, Mass.
- Screw Drivers.**
 Brown, R. H. & Co., New Haven, Conn.
 Mayhew, H. H. Co., Shelburne Falls, Mass.
- Screw Plate and Pipe Cutter.**
 Jarecki Mfg. Co., Erie, Pa.
- Screws, Makers of.**
 American Screw Co., Providence, R. I.
 Blake & Johnson, Waterbury, Conn.
 Wm. H. Haskell Co., Pawtucket.
 Miles, F. S., 205 Quarry, Philadelphia.
 Reynolds & Co., New Haven, Conn.
 Worcester Machine Screw Co., Worcester, Mass.
- Scroll Saws.**
 Barnes, W. F. & John, Rockford, Ill.
 Seneca Falls Mfg. Co., Seneca Falls, N. Y.
- Seythe Stones and Whetstones.**
 Pike Mfg. Co., Pike Statn, N. H.
 Cleveland Stone Co., Cleveland, O.
- Sewer Pipes.**
 Sharon Clay Mfg. Co., Sharon, Pa.
- Shade Hangers.**
 South, W. A. Co., Salem, Mass.
- Shafting, Makers of.**
 Brown, A. & F., 17 Dey St., N. Y.
 Cresson, Geo. V. Co., Philadelphia, Pa.
 Fairmount Mch. Co., Philadelphia, Pa.
 Sellers, Wm. & Co., Inc., Phila., Pa.
 Stow Mfg. Co., Binghamton, N. Y.
- Shaft Support.**
 Decatur Shaft Support Co., Decatur, Ill.
- Shaped Iron and Steel, Manufacturers of.**
 Aetna-Standard Iron & Steel Co., Bridgeport, O.
 East Chicago Fdy Co., Chicago, Ill.

- Allentown Rolling Mill, Allentown, Pa.**
Lockhart Iron & Steel Co., Pittsburgh, Pa.
- Pascale Rolling Mill Co., Paterson, N.J.**
Pottsville Iron & Steel Co., Pottsville, Pa.
Roberts, A. & P. & Co., Phila., Pa.
The Phoenix Iron Co., Phila., Pa.
- Shears and Scissors.**
Acme Shear Co., Bridgeport, Conn.
Clausen Shear Co., Fremont, Ohio.
Heinrichs, R. Sons Co., Newark N. J.
- Sheet Iron and Steel, Manufacturers of.**
Aetna-Standard Iron and Steel Co., Bridgeport, O.
Cambridge Iron & Steel Co., Cambridge, Ohio
Jersey City Galvanizing Co., 112 John St., N. Y.
Mahoning Valley Iron Co., Livingston, Ohio
Moorhead-McCleane Co., Pittsburgh.
Pierson & Co., 24 Broadway, N. Y.
Singer, Nimick & Co., Ltd., Pittsburgh, Pa.
The Mahoning Valley Iron Co., Youngstown, O.
Alan Wood Co., Philadelphia.
W. Dewees Wood Co., McKeesport, Pa.
- Sheet Zinc.**
Matthiessen & Hegeler Zinc Co., La Salle, Ill.
- Shelf Brackets.**
Atlas Mfg. Co., New Haven, Conn.
Stanley Works, New Britain, Conn.
- Show Cases.**
Union Show Case Co., Chicago, Ill.
- Sinks.**
Douglas, W. & B., Middletown, Conn.
- Skates, Ice.**
Dane, Stoddard & Kendall, Boston, Mass.
Keene Mfg. Co., Keene, N. H.
Winslow, Sam'l, Skate Mfg. Co., Worcester, Mass.
- Skates, Roller.**
Henley, M. C., Richmond, Ind.
Winslow, Sam'l, Skate Mfg. Co., Worcester, Mass.
- Slag Machines.**
Cambria Iron Co., Johnstown, Pa.
- Slaw Cutters.**
Tucker & Dorsey Mfg. Co., Indianapolis, Ind.
- Smelting Works.**
Reeves, Paul S., 760 S. Broad, Phila.
- Soldering Coppers.**
Clendenin Bros., Baltimore, Md.
Covert Mfg. Co., West Troy, N. Y.
- Speaking Tubes.**
Ostrander, W. R. & Co., 204 Fulton St. N. Y.
Wollensak, J. F., Chicago, Ill.
- Spelter.**
Matthiessen & Hegeler Zinc Co., La Salle, Ill.
- Spoons and Forks.**
Boardman, L. & Son, New Haddam, Conn.
Holmes & Edwards Silver Co., Bridgeport, Conn.
Rogers, The Wm. Mfg. Co., Hartford, Conn.
- Sporting Goods.**
Hartley & Graham, 313-315 B'way, N. Y.
- Springs.**
Clark & Cowles, Plainville, Ct.
Coiled Wire Belting Co., Jersey City, N. J.
Dunbar Bros., Bristol, Conn.
Miller & Van Winkle, Brooklyn, N. Y.
Morgan Spring Co., Worcester, Mass.
Roland, Wm. & Harvey, Phila., Pa.
Sabin Machine Co., Montpelier, Vt.
Washburn & Moen Mfg. Co., Worcester, Mass.
Wolff, R. H. & Co., Ltd., 118th St. and Harlem River, N. Y.
- Spring Hinges.**
Bommer Bros., Brooklyn, N. Y.
Chicago Spring Butt Co., Chicago, Ill.
Pullman Sash Balance Co., Rochester, N. Y.
Stover Mfg. Co., Freeport, Ill.
Van Wagoner & Williams Hdw. Co. 14 Warren St., N. Y.
- Stamping Works.**
Avery Stamping Co., Cleveland, O.
Cleveland Stamping & Tool Co., Cleveland, O.
- Staples.**
Cobb & Drew, Plymouth, Mass.
Titchener, E. H. & Co., Binghamton, N. Y.
- Steam Gauges.**
Bristol Co., Waterbury, Conn.
- Steam Hammers, &c., Makers of.**
Dienelt & Eisenhart, Philadelphia.
Dugdon, Richard, 24 Columbia Street, N. Y.
Tretlow Mfg. Co., Pittsburgh, Pa.
- Steam Heating & Oil Separators.**
Webster, Warren & Co., Camden, N. J.
- Steam Separators.**
Harrison Safety Boiler Wks., Phila., Pa.
Webster, Warren & Co., Camden, N. J.
- Steam Specialties.**
Lunkenhelmer Co., Cincinnati, O.
- Steel, Cold Rolled Strip.**
Superior Steel Co., Pittsburgh, Pa.
Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.
- Steel Figures and Alphabet.**
Krogsrud, W., 61 Fulton St., N. Y.
- Steel Importers.**
Abbott, Wheelock & Co., N. Y. and Boston.
Hobson, Francis, Seaman & Co., 97 John St., N. Y.
Jessop, Wm. & Sons, Sheffield, England, or 91 John N. Y.
Milne, A. & Co., 1 Broadway, N. Y.
Newton & Shipman, 83 John N. Y.
Wetherell Bros., 93 Liberty St., N. Y.
Whitney, A. R. & Co., B'way, N. Y.
Wolff, R. H. & Co., Ltd., 118th Street and Harlem River N. Y.
- Steel (Mushet's Special).**
Jones, B. M. & Co., Boston.
- Steel Manufacturers.**
Aetna-Standard Iron & Steel Co., Bridgeport, O.
Bethlehem Iron Co., S. Bethlehem, Pa.
Boker, Hermann & Co., 103 Duane St. Carbon Steel Co., Pittsburgh, Pa.
Chester Steel Castings Co., Phila., Pa.
Chrome Steel Works, Brooklyn, N. Y.
Crescent Steel Co., Pittsburgh, Pa.
Frankford Steel Co., Philadelphia.
Gautier Steel Department of Cambria Iron Co., Johnstown, Pa.
Hobson, Francis, Seaman & Co., 97 John St., N. Y.
Jessop, Wm. & Sons, Sheffield, England, or 91 John N. Y.
Kaiser, Ellison & Co., Sheffield, Eng.
La Belle Steel Co., Pittsburgh, Pa.
Lukens Iron & Steel Co., Coatesville, Pa.
Moorhead-McCleane Co., Pittsburgh, Pa.
Moss, F. W., 83 John N. Y.
Pottsville Iron and Steel Co., Pottsville, Pa.
Rowland, Wm. & Harvey, Frankford, Philadelphia.
Singer, Nimick & Co., Pittsburgh.
Superior Steel Co., Pittsburgh, Pa.
Valley Steel Co., St. Louis, Mo.
Wordlaw, S. & C., Sheffield, Eng.
Wetherell Bros., 93 Liberty, N. Y.
Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.
- Steel, Manufacturers' Agents.**
Barns, C. K. & Co., Philadelphia, Pa.
Butze, Adolph, St. Louis, Mo.
Corning, Edw. & Co., 29 B'way, N. Y.
Lindsay, Jas. G. & Co., Phila., Pa.
Pierson & Co., 29 Broadway, N. Y.
- Steel Rails, Manufacturers of.**
Bethlehem Iron Co., S. Bethlehem, Pa.
Cambria Iron Co., Johnstown, Pa.
Montour Iron & Steel Co., Danville, Pa.
Riverside Iron Wks., Wheeling, W. Va.
- Steel, Tool.**
Frankford Steel Co., Philadelphia, Pa.
Jessop, Wm. & Sons, Sheffield, England, 91 John, N. Y.
Jones, B. M. & Co., Boston, Mass.
La Belle Steel Co., Pittsburgh, Pa.
- Step Ladders, Rolling.**
Bicycle Step Ladder Co., Chicago, Ill.
Curnutt Trolley Track Mfg. Co. Bolvoke, Mass.
Croissant, M., Albany, N. Y.
- Stocks and Dies.**
Armstrong Mfg. Co., Bridgeport, Conn.
Billings & Spencer Co., Hartford, Conn.
Butterfield & Co., Derby Line, Vt.
Eart Mfg. Co., Cleveland, O.
Oster Mfg. Co., Cleveland, O.
Saunders' Sons, D., Yonkers, N. Y.
Wells Bros. & Co., Greenfield, Mass.
Wiley & Russell Mfg. Co., Greenfield, Mass.
- Stone Saws and Planers.**
Lincoln Iron Works, Rutland, Vt.
- Stove Linings.**
Ostrander Fire Brick Co., Troy, N. Y.
- Stove Pipe Thimbles.**
Cheney, S. & Son, Manlius, N. Y.
- Stove Trucks.**
Randall & Ward, Le Roy, N. Y.
- Stoves, Gasoline.**
Standard Lighting Co., Cleveland, O.
- Street Lamps.**
Rochester Lamp Co., 42 Park Place, New York.
Steam Gauge & Lantern Co., Syracuse, N. Y.
- Structural Iron Work.**
Berlin Iron Bridge Co., East Berlin, Conn.
Lindsay, Jas. G. & Co., Phila., Pa.
- Sulphuric Acid.**
Matthiessen & Hegeler Zinc Co., La Salle, Ill.
- Tacks, Brads, Staples, &c.**
Atlas Tack Corporation, Boston, Mass.
Chess Bros., Pittsburgh, Pa.
Clendenin Bros., Baltimore, Md.
Cobb & Drew, Plymouth, Mass.
Grand Crossing Tack Co., Grand Crossing, Ill.
- Tack and Nail Machinery.**
Kimball Bros. & Co., Brockton, Mass.
- Taps and Dies.**
Butterfield & Co., Derby Line, Vt.
Carpenter, J. M., Tap & Die Co., Pawtucket, R. I.
Manning, Maxwell & Moore, 111 Liberty St., N. Y.
Wells Bros. & Co., Greenfield, Mass.
Wiley & Russell Mfg. Co., Greenfield, Mass.
- Testing Laboratories.**
Riehle Bros. Testing Mach. Co., Philadelphia.
- Testing Machines.**
Riehle Bros. Testing Mach. Co., Phila.
- Theatrical Hardware.**
Wollensak, J. F., Chicago, Ill.
- Thill Springs.**
Frost Thill Spring Co., Boston, Mass.
Sabin Machine Co., Montpelier, Vt.
- Thrust Collars.**
Gouverneur Mach. Co., Gouverneur, N. Y.
- Time Record.**
Scattergood, H. W., Phila., Pa.
- Tin Plate Machinery.**
Lloyd Booth Co., Youngstown, Ohio.
- Tire Upsetters.**
Butts & Ordway, Boston, Mass.
- Toe Calks, Steel.**
Burke, P. F., Boston, Mass.
- Tool Chests.**
Am. Tool Co., 200 W. Houston St., N. Y.
- Tool Holders.**
Armstrong Bros. Tool Co., Chicago, Ill.
- Tools.**
Brown, R. H. & Co., New Haven, Conn.
Mayhew, H. M. Co., Shelburne Falls, Mass.
Millers Falls Co., 93 Reade, N. Y.
Richardson, C. F. & Son, Athol, Mass.
Standard Tool Co., Athol, Mass.
Stanley Rule & Level Co., 29 Chambers.
Starrett, L. S., Athol, Mass.
Stevens, J., Arms & Tool Co., Chicopee Falls, Mass.
- Tools, Blacksmith and Wheelwright.**
Buffalo Forge Co., Buffalo, N. Y.
Butts & Ordway, Boston, Mass.
Champion Blower & Forge Co., Lancaster, Pa.
Oster Mfg. Co., Cleveland, Ohio.
Plumb, Favette R., Philadelphia, Pa.
Wiley & Russell Mfg. Co., Greenfield, Mass.
- Tools, Steam and Gas Fitters'.**
Saunders' Sons, D., Yonkers, N. Y.
- Torches, Oil and Gasoline.**
Dangler Stove & Mfg. Co., Cleveland, O.
Schneider & Trenkamp Co., Cleveland, Ohio.
Standard Lighting Co., Cleveland, O.
- Transom Lifters.**
Wollensak, J. F., Chicago, Ill.
- Trucks, Manufacturers of.**
Clark, G. P., Windsor Locks, Conn.
- Tubes, Seamless Drawn Copper.**
Ansonia Brass & Copper Co., 19 and 21 Cliff, N. Y.
Randolph & Clowes, Waterbury, Conn.
- Tubes, Steel.**
Avery Stamping Co., Cleveland, O.
Leng's, John S. Son & Co., 4 Fletcher St., New York.
U. S. Projectile Co., Brooklyn, N. Y.
- Tumbling Barrels.**
Henderson Bros., Waterbury, Conn.
- Turbines.**
Cleveland City Forge & Iron Co., Cleveland, O.
Merrill Bros., Brooklyn, E. D.
- Twist Drills, Makers of.**
Cleveland Twist Drill Co., Cleveland.
Morse Twist Drill & Machine Co., New Bedford, Mass.
New Process Twist Drill Co., Taunton, Mass.
Standard Tool Co., Cleveland.
- Valves, Gas, Water and Steam.**
Chapman Valve Mfg. Co., Boston.
Eynon-Evans Mfg. Co., Philadelphia, Pa.
Jenkins Bros., 71 John, N. Y.
Lunkenhelmer Co., Cincinnati, O.
McNab & Harlin Mfg. Co., 66 John, N. Y.
- Ventilator Appliances.**
Howard & Morse, 45 Fulton St., N. Y.
- Vise Jaws.**
Newark Mch. Tool Co., Newark, N. J.
- Vises.**
Graham, John H. & Co., 113 Chambers Street, N. Y.
Hollands Mfg. Co., Erie, Pa.
Howard Iron Works, Buffalo, N. Y.
Millers Falls Co., 93 Reade St., N. Y.
Parker, Chas. Co., Meriden, Conn.
Prentiss Vise Co., 44 Barclay, N. Y.
- Wagon Jacks.**
Covert Mfg. Co., West Troy, N. Y.
Covert's Saddlery Works, Farmer, N. Y.
- Washers.**
Haskell, Wm. H. Co., Pawtucket, R. I.
Milton Mfg. Co., Milton, Pa.
Newbury, Jay Herbert, Guilderland, N. Y.
Sternbergh, J. H. & Son, Reading, Pa.
- Washing Machines.**
Richmond Cedar Wks., Richmond, Va.
- Water Meters.**
Worthington, Henry R., 86 & 88 Liberty St., N. Y.
- Water Wheels.**
Poole, Robt. & Son Co., Baltimore, Md.
- Wheelbarrows.**
Amer. Steel Scraper Co., Sidney, Ohio.
Bryan Mfg. Co., Ayran, Ohio.
Sidney Steel Scraper Co., Sidney, O.
Withington & Cooley Mfg. Co., Jackson, Mich.
- Window Cord, Makers of.**
Samson Cordage Works, Boston, Mass.
- Wire, Manufacturers of.**
Gautier Steel Department of Cambria Iron Co., Johnstown, Pa.
Miller & Van Winkle, Brooklyn, N. Y.
New Castle Wire Nail Co., New Castle, Pa.
New Haven Wire Mfg. Co., New Haven, Conn.
Salem Wire Nail Co., Salem, O.
Trenton Iron Co., Trenton, N. J.
Washburn & Moen Mfg. Co., Worcester.
Wetherell Bros., 63 Liberty St., N. Y.
Wolff, R. H. & Co., Ltd., 118th St. and Harlem River, N. Y.
Wright & Colton Wire Cloth Co., Worcester, Mass.
- Wire Cloth.**
Barnum, E. T., Detroit, Mich.
Clinton Wire Cloth Co., Clinton, Mass.
Darby, Edward & Sons, Philadelphia.
Estey, W. S., 65 Fulton, N. Y.
Gilbert & Bennett Mfg. Co., 42 Cliff.
Howard & Morse, 45 Fulton, N. Y.
Ludlow-Saylor Wire Co., St. Louis, Mo.
N. J. Wire Cloth Co., Trenton, N. J.
Scheeler & Sons, Buffalo, N. Y.
Wickwire Bros., Cortland, N. Y.
Wright & Colton Wire Cloth Co., Worcester, Mass.
W. S. Tyler Wire Works Co., Cleve'd.
- Wire Cutters.**
Higginum Hdw. Co., Higganum, Conn.
King, J. M. & Co., Watertown, N. Y.
- Wire Dies.**
McFarland, Wm., Trenton, N. J.
Newton & Shipman, 83 John St., N. Y.
- Wire Fences, See Fencing, Iron and Wire.**
- Wire Goods, Manufacturers of.**
Bromwell Brush & Wire Goods Co., Cincinnati, Ohio.
Darby, Edward & Sons, Phila.
Gilbert & Bennett Mfg. Co., 42 Cliff St., N. Y.
Ludlow-Saylor Wire Co., St. Louis.
Ossawan Mills Co., Norwich, Conn.
Scheeler & Sons, Buffalo, N. Y.
Wickwire Bros., Cortland, N. Y.
Williamson, C. T., Wire Novelty Co., Newark, N. J.
Wire Goods Co., Worcester, Mass.
- Wire Machinery.**
Am. Tool Wks., Cleveland, O.
Manville, E. J. Mch. Co., Waterbury, Ct.
Morgan Construction Co., Worcester, Mass.
Waterbury Mch. Co., Waterbury, Conn.
- Wire Straightening and Cutting Machinery.**
Adt, John & Son, New Haven, Conn.
- Wire Nails.**
Bond Nail Co., Raynham, Mass.
Indiana Wire Fence Co., Crawfordsville, Ind.
Kilmer Mfg. Co., Newburg, N. Y.
New Castle Wire Nail Co., New Castle, Pa.
Phillips, Townsend & Co., Phila., Pa.
Salem Wire Nail Co., Salem, O.
Taunton Wire Nail Co., Taunton, Mass.
Whitney, A. R. & Co., New York City.
- Wire Rods, Steel.**
New Castle Wire Nail Co., New Castle, Pa.
Washburn & Moen Mfg. Co., Worcester, Mass.
Whitney, A. R. & Co., 17 B'way, N. Y.
Wolff, R. H. & Co., Ltd., 118th Street and Harlem River, N. Y.
- Wire Rope, Iron and Steel, Makers.**
Broderick & Bascom Rope Co., St. Louis, Mo.
California Wire Works, San Francisco.
Hazard Mfg. Co., Wilkesbarre, Pa.
A. Leschen & Sons Rope Co., St. Louis.
Trenton Iron Co., Trenton, N. J.
Washburn & Moen Mfg. Co., Worcester, Mass.
- Wire Rope Machinery.**
Kay, J. F., Passaic, N. J.
- Wood Turning.**
Cleveland Wood Turning Co., Cleveland, O.
- Wood-Working Machinery.**
Fay, J. A. & Co., Cincinnati, O.
Seneca Falls Mfg. Co., Seneca Falls, N. Y.
- Wrenches, Manufacturers**
Bemis & Call Hardware & Tool Co., Springfield, Mass.
Billings, Spencer & Co., Hartford, Conn.
Coss Wrench Co., Worcester, Mass.
Graham, Jno. H. & Co., 113 Chambers St., N. Y.
Trimont Mfg. Co., Roxbury, Pa.
Walworth Mfg. Co., Boston, Mass.
- Wringers.**
Colby Wringer Co., Montpelier.
National Wringer Co., Canton, O.
- Yacht Hardware.**
Ferdinand, L. W., & Co., Boston, Mass.

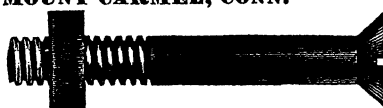
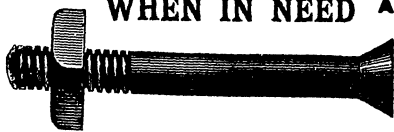
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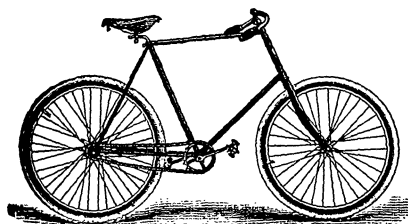
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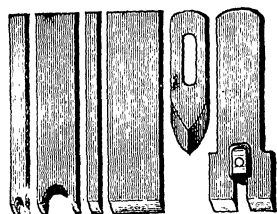
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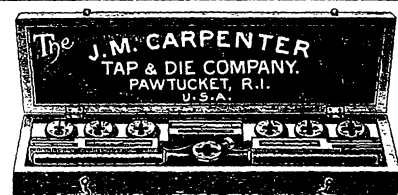
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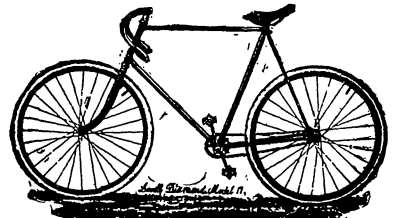
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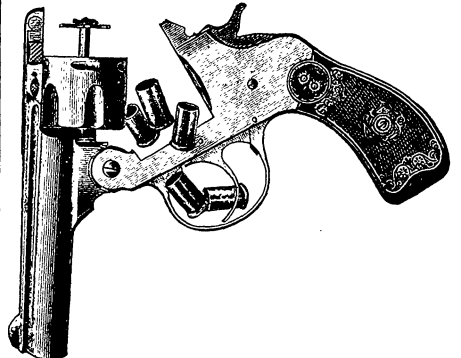
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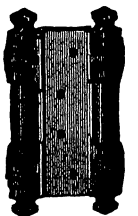
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7x2 $\frac{1}{2}$	1 to $1\frac{1}{2}$	5 in	65
7x2 $\frac{1}{2}$	1 to $1\frac{1}{2}$	6 in	66
8x2 $\frac{1}{2}$	$1\frac{1}{2}$ to $1\frac{3}{4}$	7 in	67
8x3	$1\frac{1}{2}$ to $2\frac{1}{2}$	8 in	68
9x3	$1\frac{3}{4}$ to $2\frac{1}{2}$	10 in	69

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THE IRON AGE

THURSDAY, SEPTEMBER 13, 1894.

To Bridge the Hudson River at New York.

[With Supplement.]

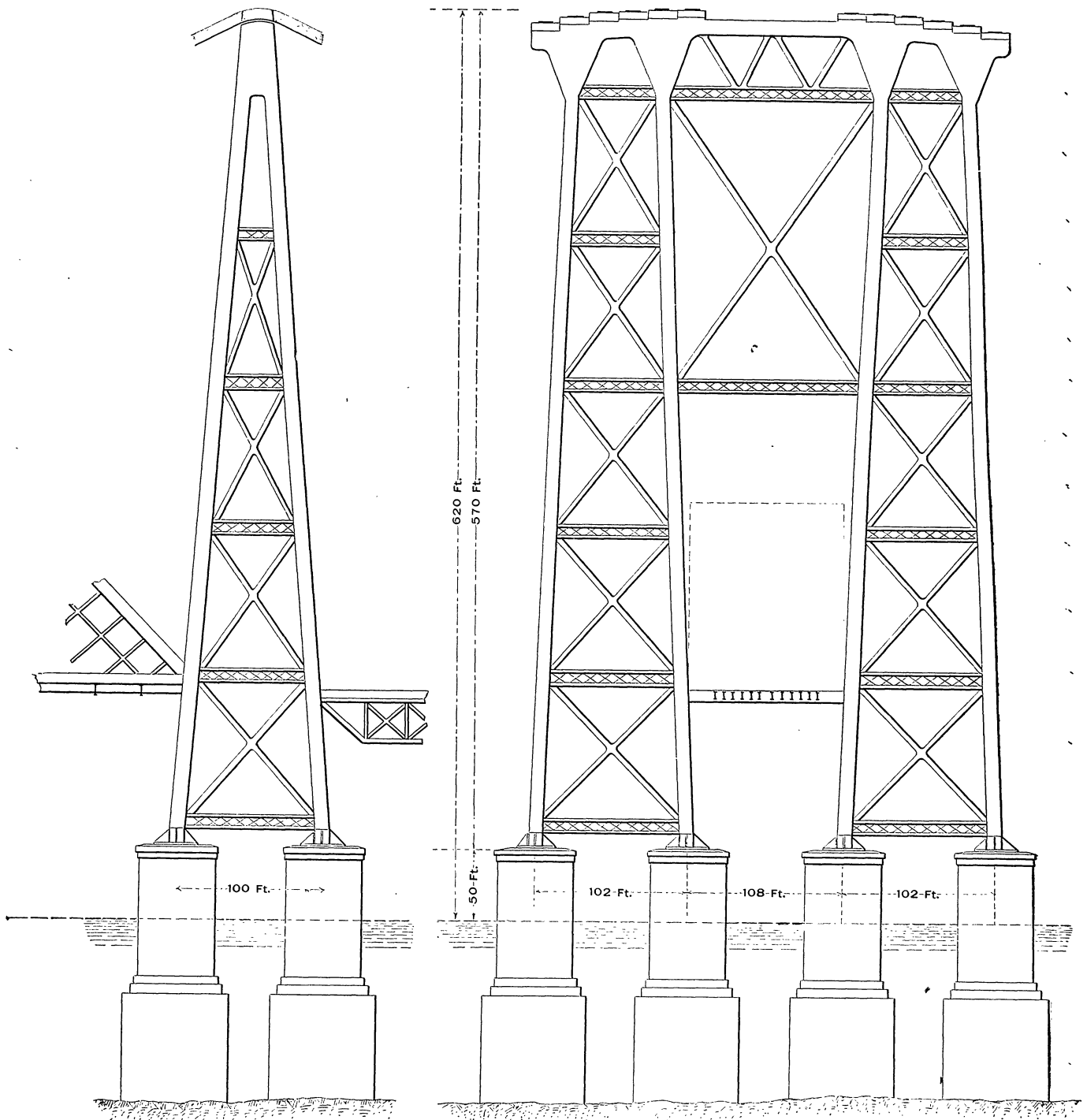
The report to the Secretary of War of the Board of Engineers appointed to

Burr, Columbia College; Theodore Cooper, New York; George S. Morison, New York and Chicago, and Major C. W. Raymond, Corps of Engineers, U. S. A. In the following we present such portions of the report as will, we think, be of most interest to our readers. The accompanying drawings show,

suspension bridge. We may further add, in introduction, that the board considered four plans, as follows:

2000-foot cantilever, costing.....	\$25,443,000
3100-foot cantilever, costing.....	\$1,128,000
3100-foot suspension, costing.....	35,367,671
Lighter suspension, same plan, costing.....	30,743,000

The minimum length of span which



Figs. 5 and 6.—Elevations of Towers of 3100-foot Suspension Bridge.

TO BRIDGE THE HUDSON RIVER AT NEW YORK.

recommend what length of span, not less than 2000 feet, would be safe and practicable for a railroad bridge to be constructed over the Hudson River, between Fifty ninth and Sixty-ninth streets, New York, has been published. The board was composed of L. F. G. Bouscaren of Cincinnati; Prof. W. H.

in Fig. 4 of the supplementary sheet of engravings, a profile of the river on the line of the bridge; Fig. 1 is a perspective view of a model of a design by the Union Bridge Company for a cantilever bridge of 2100 feet span; Fig. 8 shows the river pier of this bridge; the remaining drawings show the 3100-foot

may be considered is 2000 feet, which your board has interpreted as meaning 2000 feet in the clear. The maximum length of span would be a clear span between the pier head lines, this distance varying from 3130 feet at Fifty-ninth street to 3080 feet at Sixty-ninth street. A span of 3100 feet in the clear

would meet all the requirements of a single span. The plans submitted by the bridge companies provide for a cantilever bridge carrying six railroad tracks. . . . Your board have thought it right to make estimates for a bridge furnishing this accommodation. . . . In the first place, your board are of the unanimous opinion that a cantilever span 3100 feet in the clear could be built and would be a safe structure.

In the second place your board have considered that the practicability of such a structure would depend upon its cost, and to determine this practicability have made comparative estimates of the cost of two cantilever bridges with clear spans of 2000 feet and 3100 feet respectively. These estimates are comparative rather than absolute; the benefit of doubt, where any exists, has been given to the longer span. The estimates include both substructure and superstructure, but have been made in round numbers and do not include the cost of tracks and other features which would be common to both plans.

A series of borings has been made by the bridge companies under the direction of C. B. Brush, C. E., at the request of your board, to determine the character of the bottom of the river. These borings, Fig. 4, have found rock at varying depths, but as the borings were not extended into the rock, the absolute information before your board is that no rock exists above the reported elevation rather than that solid rock exists below it; but your board have considered themselves justified in assuming that it is a substantial rock, suitable for foundations.

2000 Feet Clear Span Cantilever.

The east pier of this bridge, which has a clear span of 2000 feet, would be immediately back of the New York pier head line, where the rock is 125 feet below mean high water. The west pier would come in the river, where the rock is 260 feet below mean high water. The east anchorage would be within the shore line, where the rock is not more than 20 feet below mean high water, and the west anchorage would be immediately west of the New Jersey pier head line, where the rock is 125 feet below mean high water. The site of the west anchorage calls for an anchorage span 100 feet longer than shown on the plan of the bridge companies.

The east pier would consist of four cylinders, each containing 866,000 cubic feet, and costing on the basis given above, \$866,000, making for the four cylinders \$3,464,000.

At the site of the west pier (river) the average depth of rock is not less than 260 feet. A foundation carried to rock here would be nearly 100 feet deeper than any foundation which has ever been put in. Such a foundation involves very careful consideration, and your board believe that the additional price allowed for so much of the work as is more than 125 feet below water is none too large. Each of the four cylinders would contain 1,880,000 cubic feet, of which 1,014,000 would be more than 125 feet below water, making the cost of each cylinder \$2,427,500 and the cost of the four cylinders \$9,710,000.

The east anchorage pier would be founded on the rock about 20 feet below mean high water, and the west pier on rock 125 feet below water. Each of these piers should be estimated on the basis of a pier finishing 150 feet

above high water, 20 feet thick, and 100 feet long on top, built with a batter of 1 in 20, and founded on a caisson 40 x 120 feet for the east pier, and 45 x 125 feet for the west pier. Taking the cost of the work above water at 75 cents per cubic foot, and of the work below water at \$1, the cost of the east pier becomes \$431,000, and that of the west pier \$1,038,000. The cost of the sub-

distance between pier head lines is 3070 feet. At Fifty-ninth street the west anchorage span would be lengthened 100 feet, and if the bridge is kept symmetrical the whole length will be increased to 4320 feet and the total weight to about 240,000,000 pounds. This estimate is based on a moving load of 3000 pounds per foot of track and on maximum working stresses of from

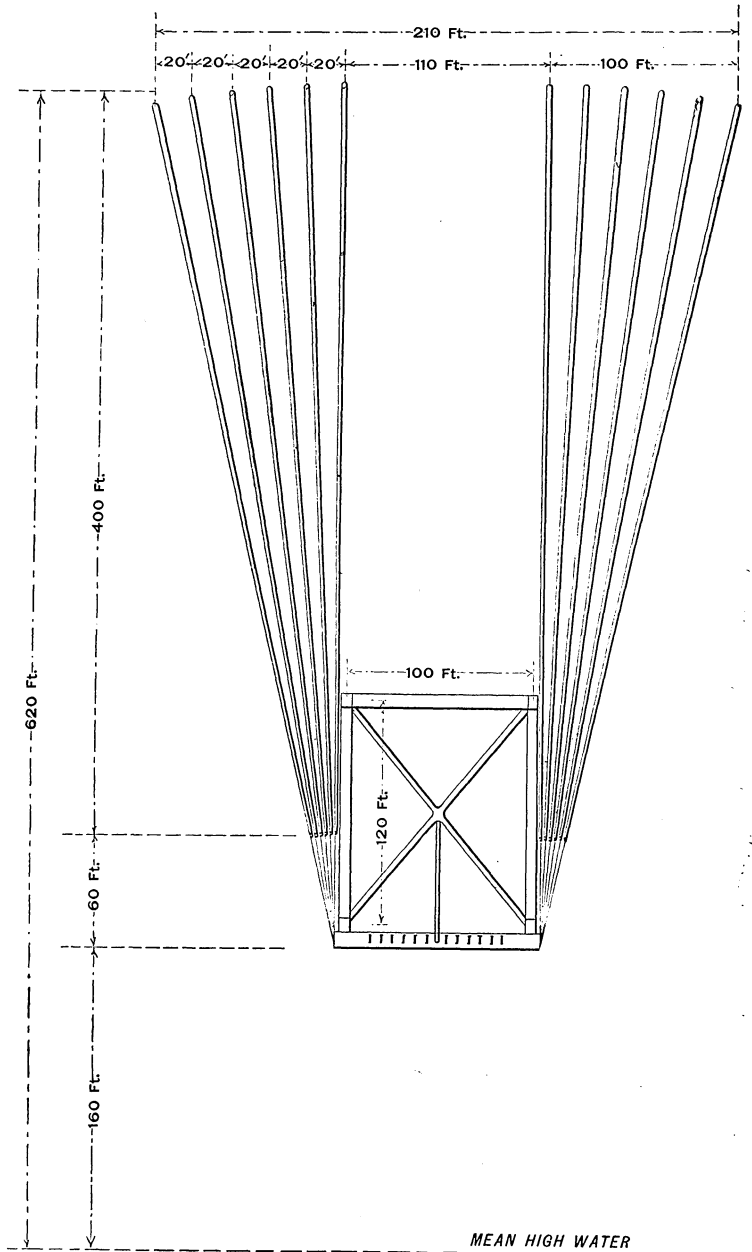


Fig. 7.—Sectional Elevation through 3100-foot Suspension Bridge at Center.

TO BRIDGE THE HUDSON RIVER AT NEW YORK.

structure for the bridge with the 2000-foot span would be:

East anchorage.....	\$431,000
East pier.....	3,464,000
West pier.....	9,710,000
West anchorage.....	1,038,000
Total.....	\$14,643,000

A careful estimate prepared by the bridge companies makes the weight of the superstructure 230,000,000 pounds, including the main span, the towers and the two anchorage spans, covering a total length of 4120 feet. This weight has been checked and may be taken as approximately correct. The plan was prepared for a location at Seventy-second street, where the

20,000 to 22,500 pounds per square inch, or about one third of the ultimate strength of the material; 240,000,000 pounds, at 4½ cents per pound, would cost \$10,800,000. The cost of this bridge would then be \$25,443,000.

This is the cost of a cantilever bridge of the minimum span which your board are authorized to consider, the length of the entire structure from anchorage to anchorage being 4320 feet. As this plan of bridge is the one which the New York and New Jersey Bridge Companies have selected as the bridge they wish to build, its cost must be accepted for present purposes as the cost of a practical structure.

3100 Feet Clear Span Cantilever.

The site of the east pier for the span of 3100 feet would be the same as that for the 2000 foot span; the site of the west pier would be the same as that of the west anchorage for the 2000-foot span. Both piers would be founded at practically the same depth, or 125 feet below mean high water. The weight of the trusses of the long span would be about three times the weight of those

of the two piers of the 3100-foot span bridge at \$8,660,000.

The anchorage piers required for the long span bridge need be little larger above the water level than for the shorter span. The anchorage pier on the east side would be on rock about 20 feet below mean high water; its cost would be about the same as that for the 2000-foot span. The anchorage pier on the west side would be on rock 40 feet below mean high water and is estimated

therefore be estimated at \$51,128,000, though this estimate is probably too low.

The estimated cost of the 2000-foot span bridge was \$25,443,000 for 4320 feet. To bring it into proper comparison with the longer span bridge, 1780 feet of viaduct must be added. Estimating this viaduct at \$1000 a foot, the cost becomes \$27,223,000. The estimated cost of the long span cantilever bridge is \$23,905,000 more than this amount. Your board are of the opinion that the additional cost of the long span cantilever bridge is so great that it must be considered impracticable.

3100 Feet Clear Span Suspension.

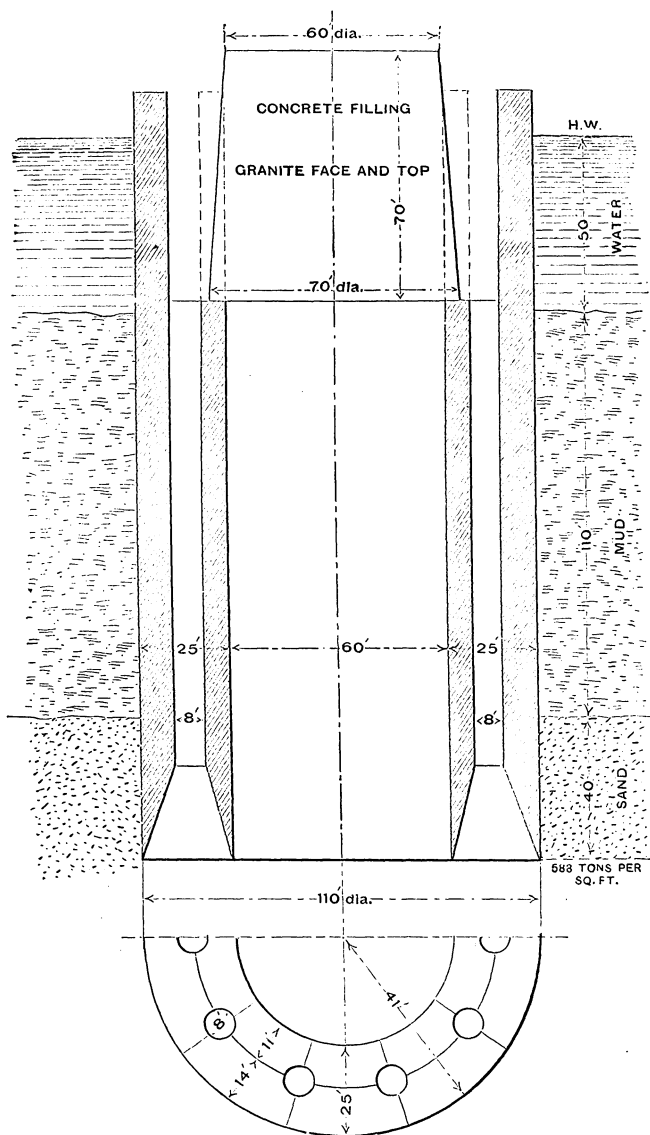
[The Board are of the opinion that such a bridge "could be built and that it would be a safe structure." The report explains the essential differences between a cantilever and a suspension bridge, and explains the three principal methods that have been employed to secure greater rigidity in the latter type. The third method, a stiffening truss, is the one adopted in the plan submitted.]

The suspension bridge which your Board have selected for this location would consist of a single span of 3200 feet between saddles, thus giving about 3100 feet in the clear, the two towers being located at the pier head lines and the cables being carried in straight lines from the top of the towers to the anchorages, making equal angles on each side of the towers. This form of bridge has no side spans, but the tracks would be carried on viaducts between the towers and the anchorages. While the use of cables outside the towers to sustain side spans is generally considered economical, the arrangement selected gives the least length of cable and reduces deflection from strains and temperature to a minimum.

The two towers, Figs. 5 and 6, would be located in practically the same position as the towers of the 3100-foot cantilever. The substructure would be of masonry, finishing at the same height as the masonry of the cantilever bridge piers. The towers themselves would be of steel, and would be 570 feet high from top of masonry to saddles, or 620 feet from surface of water. For towers of this height there is no question of the economy and expediency of using metallic construction. The anchorages would be of masonry, each located about 1000 feet back of the towers. Both towers and anchorages would have to be founded on rock.

The cables would be of wire, and the plans have been based on cable containing about 6000 No. 3 wires (0.259 inch in diameter). Wire makers are prepared to furnish a wire of this size of the guaranteed strength of 180,000 pounds per square inch at moderate prices, and a much stronger wire at a higher price. Your board have adopted as the unit stress on cables made of straight wire of this character 60,000 pounds per square inch, or one third of the breaking stress, this being the same proportion of the ultimate strength that the 20,000 pounds adopted in the cantilever structure bears to the probable strength of eye bar steel.

Your board have estimated on a versed sine of 400 feet, or one-eighth of the span. In the East River bridge the versed sine is less than one-twelfth of the span and about the same as in other long span suspension bridges. In the East River bridge the cables are of steel wire and the towers of masonry. With the introduction of steel towers



25,000 tons from dead, moving and wind loads on superstructure = 8.84 tons per square foot =
123 pounds per square inch.

Fig. 8.—Vertical Section of Foundation of River Pier of 2100-Foot Cantilever.

TO BRIDGE THE HUDSON RIVER AT NEW YORK.

of the short span, and the weight of the floor and moving load would be about one and a half times that of the short span. The total reaction on the piers would be at least two and one-half times that of the short span. On this supposition each of the four cylinders would have to carry 62,500 tons.

The piers in both bridges are so large that their volume can be proportioned directly to the weights they have to carry. This would make the volume of each pier of the 3100-foot span bridge two and a half times that of the east pier of the 2000-foot span bridge. The estimated cost of the east pier of the 2000-foot span bridge was \$3,464,000, so that we may estimate the cost of each

to cost \$527,000. The total cost of the substructure for the 3100 feet clear span bridge would then be:

East anchorage.....	\$431,000
East pier.....	8,660,000
West pier.....	8,660,000
West anchorage	527,000
	<hr/>
Total.....	\$18,278,000

Estimates by this board show that the weight of the superstructure of this bridge would be approximately 730,000,000 pounds, about three times that of the shorter span bridge. This, at $4\frac{1}{2}$ cents per pound, is \$32,850,000.

The total cost of the 3100-foot span bridge, covering a length of 6100 feet from anchorage to anchorage, may

the economical proportions are changed and it becomes practicable to adopt a greater versed sine than has hitherto been considered wise.

[Stiffening Truss.]—The report explains the duties and mode of action of the stiffening truss. Its function is to distribute a load covering only a part of the span over the entire span. The only stresses in such a truss are those due to moving load, all dead weight being carried directly to the cables by the suspenders.]

The form which your board have selected for a stiffening truss (Fig. 2) is a riveted lattice girder 120 feet deep, the two trusses being placed 100 feet between centers. The web members are all inclined at an angle of 45°, and are in eight systems, so that the truss is divided into 30-foot panels, and the unsupported length of each web member is about 21 feet. The floor beams are hung from the suspenders and carry the stiffening truss, the weight of which is never entirely overcome by the action of the moving load. The top lateral system is a comparatively light riveted lattice. The whole lateral work to resist wind pressure is done by the bottom lateral system, in which the floor beams form lateral struts and the diagonals are strained in tension. Cross bracing is provided at every panel point to sustain the floor beams at their centers and to transfer wind pressure to the bottom chord, the pull of this cross bracing being resisted by the top lateral system.

The floor beams weigh 90,000 pounds each, or 3000 pounds per lineal foot of bridge. The stringers weigh 1800 pounds per lineal foot of bridge. Floor beams and stringers are proportioned for a consolidation locomotive, weighing with tender 104 tons. The total weight of the suspended superstructure per lineal foot may then be taken as follows:

	Pounds.
Four chords, at 4,037.5 pounds.....	16,150
Two webs, at 3,509 pounds.....	7,018
Laterals.....	1,650
Cross frames and hangers.....	1,920
Floor beams.....	3,000
Stringers.....	1,800

Total steel per lineal foot.....31,538

This amounts to 100,921,600 pounds for the 3200 feet of span. If to this we add 2400 pounds for the weight of the ties and rails and 18,000 pounds for moving load, we have as the total weight carried by the suspenders 51,938 pounds, or 26 tons per lineal foot.

This stiffening truss is a very different structure from the stiffening truss of any existing bridge. It is what it purports to be, a stiffening truss, with a heavy floor system like that used in the cantilever design, and with stiff connections throughout. This stiffening truss, 3200 feet long, with its floor system, weighs two-fifths as much as the entire 4320 feet of steel work of the 2000-foot cantilever bridge.

Suspenders.—The suspenders would be either wire ropes or cables of straight wires like the main cable. They have been proportioned on the basis of a stress of 30,000 pounds per square inch of section, and on this basis, with an allowance of 20 per cent. for connections, will weigh 1425 pounds per lineal foot, making the whole weight transferred to the cables 53,363 pounds. The suspenders weigh 4,560,000 pounds for the 3200 feet.

Cables.—The average weight of the cables will be 14,792 pounds per lineal foot of bridge. The total weight to be carried by the cables may therefore be taken at 68,100 pounds per lineal foot, amounting to 217,920,000 pounds, or

109,000 tons, for the span of 3200 feet. The versed sine assumed is 400 feet, or one-eighth of the span. The greatest strain in the cables will be next to the saddles, and will be equal to the weight carried multiplied by 1.118, amounting to 243,724,000 pounds, which, at 60,000 pounds per square inch, will require 4062 square inches. Six thousand No. 3 wires have a total area of 316 square inches. The 4062 square inches may be divided into 12 cables of 338.5 inches each. Your board believe that these cables can be constructed now as easily as those of the East River bridge were at the time it was built.

The arrangement of cables (Figs. 5 to 7) which has seemed most feasible to your board, and which has been used for the basis of these estimates, places six cables on each side, the cables being 20 feet apart on top of towers, the two cables next to the center on each side being in vertical planes, and the other cables cradled into planes which intersect in the lines of the pins which sustain the floor beams. A separate suspender reaches from each pin to every cable, the suspenders being in the same planes as the cables.

Vertically the cradling of the outside cables is 100 feet in a height of 460 feet, or 1 in 4.6. Horizontally it is 100 feet in a total length of 3200 feet, so that the horizontal cradling of the two outside cables is 200 feet in 3200 feet, or 1 in 16. A sufficient cradling is obtained not only to resist the entire wind pressure on the cables, but to relieve the lateral system very materially. The distance between the cables will favor simultaneous construction. The suspenders at each point will be of uniform length and will pull together. The length of the suspenders at the center of the span must be enough to allow the cables to clear each other where the attachment is made, and this places the lowest parts of the cables 60 feet above the pins. The total height of the towers above high water is made up as follows:

	Feet.
Clearance required by law.....	150
Camber.....	10
Shortest suspender.....	60
Versed sine.....	400
Total.....	620

The total length of each cable from anchorage to anchorage is 5609 feet. The weight of each of the 12 cables per lineal foot of cable, including wrapping, is 1183 pounds. The weight of the 12 cables is 14,200 pounds per lineal foot and the total weight of the cables 79,647,800 pounds.

Towers.—The weight transferred by the cables to each tower is 218,000,000 pounds. The towers are 570 feet high from top of masonry to saddles. As these towers are only in compression and the members so large that they may be treated as short compression members, a stress of 20,000 pounds per square inch at the top is permissible. This requires 10,900 square inches of section. The weight of each tower, with an allowance of 80 per cent. for details and connections, would be 38,023,560 pounds, or 76,047,000 pounds for both towers. The total weight to be carried on the lower part of the tower would be 128,000 tons, making a pressure of less than 24,000 pounds per square inch at the base of the steel columns, which will be very slightly increased by the wind pressure and by the horizontal deflections at the top of the towers if the saddles do not move freely.

Anchor Chains.—The cables are car-

ried in straight lines from the saddles to the anchorages, each anchorage being in two parts, each part anchoring the six cables on its side of the bridge. The upward pull of the cables at each anchorage (one side) is 54,500,000 pounds, and the horizontal pull 109,000,000 pounds. The estimates have been made on the basis of connecting the cables with the anchor bars outside of the masonry of the anchorage, placing these anchor bars in tunnels and connecting them with bearing plates at the lower ends. Everything would be accessible for care and repairs. The chains would be of steel eye bars, which have been proportioned for a stress of 20,000 pounds per square inch, with an allowance of 20 per cent. for details. The estimated weight of the bars and pins in each of the four half anchorages is 6,825,000 pounds, while the plates at the bottom would add 600,000 pounds to this amount, making the total weight in each half anchorage 7,425,000 pounds, or 29,700,000 pounds in the four.

Structural Steel.—In estimating the cost of the structural steel work your board used the same price per pound as for the work in the cantilever bridge—namely, 4½ cents. On this basis the cost would be as follows:

	Pounds.
Suspended superstructure.....	10,921,600
Towers.....	76,047,000
Chains.....	27,300,000
Anchor plates.....	2,400,000

Structural steel.....206,668,600

At 4½ cents.....\$9,300,087

The majority of the board believes that this price is too high, owing to the difference in character of steel work in the two structures, and that the total cost of the structural steel work should not be estimated higher than \$8,500,000.

Wire Work.—The cables and suspenders have been estimated at 8 cents per pound, making their cost:

	Pounds.
Cables.....	79,647,800
Suspenders.....	4,560,000
Total wire.....	84,207,800

At 8 cents.....\$6,736,624

Superstructure.—The total cost of the superstructure is \$16,036,711, on the basis of 4½ cents for all structural steel.

Substructure.—The substructure would consist of two anchorages and the bases for two towers. Each tower base has to carry the following weights:

	Tons
Suspended weight on top of the tower.....	109,000
Tower.....	19,000
Extra effect of wind.....	4,000
Total.....	132,000

Each of the tower bases of the 2000 feet cantilever bridge carries 100 tons. In both cases the foundations can be made proportional to the weight carried. The east tower is in the same place as in the east pier of the cantilever bridge. The cost of this base for the suspension bridge tower will be that of the cantilever bridge pier, or \$3,464,000, multiplied by 1.32, making \$4,572,480.

The west tower would come immediately west of the New Jersey pier head line, the average depth of rock being about 10 feet more than on the east side, requiring 414,000 cubic feet additional in the foundation. Estimating on the same basis as for the west pier of the cantilever bridge, the cost of this 414,000 cubic feet of foundation would be \$431,000, which would make

the cost of the west tower base \$5,003,480.

The anchorages have been planned on the basis of putting the entire weight which is to resist the pull of the cable above mean high water, and the quantities have been based on a coefficient of friction of 0.6 and a factor of safety of two. The anchorage at each end of the bridge would contain 5,940,000 cubic feet above the foundation. The only duty of the anchorage is to act as weight, and a very cheap class of masonry can be used for this purpose; rubble, made of the most available stone, with a facing of rough ashlar or brick, would do. The cost of this masonry has been estimated at 37½ cents per cubic foot, although the board believe it could be built for much less. On this basis the cost of each anchorage above the mean high water is \$2,227,500.

The east anchorage would be founded where the rock is 20 feet below mean high water; the foundation could be put in with a coffer dam and has been estimated as costing 75 cents per cubic foot. There would be 1,150,000 cubic feet in this foundation, making the cost \$862,500, and the total cost of the east anchorage \$3,090,000.

The foundation of the west anchorage would have to be sunk 60 feet to reach the rock, and would probably be put in by the pneumatic process. Its volume would be three times that of the east anchorage, and its cost may be estimated at the same price per cubic foot, or \$2,587,500, making the total cost of the west anchorage \$4,815,000.

The total cost of the substructure would then be:

East anchorage.....	\$3,090,000
Base for east tower.....	4,572,480
Base for west tower.....	5,003,480
West anchorage.....	4,815,000
Substructure total.....	\$17,480,960

The anchorages can be adapted to carry the tracks, but the tracks must be carried between them and the towers on viaducts, requiring 925 feet of viaduct on each side, or 1850 feet in all, which has been estimated at the same price as before. The total length of the suspension bridge, including viaducts and anchorages, is 5,600 feet. The total cost will be as follows:

Superstructure.....	\$16,036,711
Substructure.....	17,480,960
Viaduct.....	\$33,517,671
Total.....	\$35,367,671

The estimated cost of the 2000-foot cantilever bridge was \$25,443,000 for 4320 feet. To compare it with the 5600 foot suspension bridge 1280 feet of viaduct must be added. This makes the cost \$26,723,000. The estimated cost of the suspension bridge is \$8,644,671 more. The fairest comparison is by percentages; the cost of the suspension bridge is nearly 32½ per cent. more than that of the 2000-foot cantilever bridge. If allowance is made for cost of structural steel in accordance with the views of a majority of the board, the difference will be reduced to \$7,844,584, or nearly 30 per cent. The general conclusion which your board have reached is that the cost of a suspension bridge of a single span, designed for its whole length for the same moving load as the 2000-foot cantilever bridge, would be less than one-third more than that of the cantilever.

[The report considers the deflections that would take place in this bridge under different conditions and then describes briefly a lighter suspension bridge on the same plan].

Lighter Suspension Bridge—Same Plan.

From this part of the report we take the following:

If the stiffening truss did its complete duty in the distribution of weight, the greatest strain which a train 1000 feet long, weighing 3000 pounds per foot, could throw upon the cables would correspond to a uniform load of 937 pounds. If the stiffening truss did no duty whatever, but the weight was distributed strictly according to the laws of leverage, the greatest strain which such 1000-foot train could throw upon the cables would correspond to a uniform load of 1582 pounds per lineal foot. Under these circumstances it seems safe, while not reducing the stiffening truss, to provide for a moving load on the cables of only 1500 pounds per foot of track. For this approximate calculation the weights per lineal foot may then be taken as follows:

	Pounds.
Suspended superstructure and tracks.....	34,000
Moving load.....	9,000
Cables and suspenders.....	14,000
Total.....	57,000

This is 28½ tons per lineal foot instead of 34 tons, the reduction in the total carrying capacity being about 16 per cent. It should be observed that the live load is only 15 8 per cent. of the whole, so that the additional stress put on the cables by the simultaneous passage of six maximum trains would, without allowance for the work of the stiffening truss, be only 10 000 pounds per square inch. The stress imposed by a 1000 foot passenger train under the most unfavorable conditions would not be over 1200 pounds.

For the purposes of present comparison the suspended superstructure remains unchanged; all other parts may be taken at 16 per cent. less than in the previous estimate. The weights and cost of such a bridge may then be estimated as follows:

	Pounds.
Suspended superstructure.....	101,000,000
Towers.....	64,000,000
Chains and anchor plates.....	25,000,000
Structural steel.....	190,000,000
4½ cents.....	\$3,550,000
Wire work.....	5,659,100
Total superstructure.....	\$14,209,000
Substructure.....	14,684,000
Add for viaduct.....	\$28,873,000
Total.....	\$30,743,000

This is \$4,625 000 less than the previous estimate, and \$4,020,000, or about 15 per cent., more than the cost of the cantilever with the 2000-foot clear span.

This estimate has been made for the purpose of comparing, on the same basis, that of a factor of safety of three on ultimate strength of metal, the 2000 foot cantilever and the suspension bridge when carrying train loads 1000 feet long.

If it be thought that the stress of 60,000 pounds per square inch on the wire in the cables is too high, it may be noted that the difference in the cost of wire work in the two suspension bridge estimates is \$1,017,634, and if the higher cost is restored it will be equivalent to reducing the stress in wire to about 50,000 pounds per square inch. With this change the cost of the lighter structure becomes \$31,671,000, this being \$5,038,000, or about 19 per cent., more than that of the 2000-foot cantilever.

Conclusion.

The only subject referred to your board is to "recommend what length

of span, not less than 2000 feet, would be safe and practicable for a railroad bridge to be constructed over the Hudson River, between Fifty-ninth and Sixty-ninth streets."

A single span from pier head to pier head, built on either the cantilever or suspension principle, would be safe.

The estimated cost of the 3100-foot clear span cantilever being about twice that of the shorter span, your board consider themselves justified in pronouncing it impracticable on financial grounds.

As the cost of the single span suspension bridge is almost one third greater than that of the 2000 foot cantilever, your board are unable to say that such greater cost is enough to render the suspension bridge impracticable.

The board feel that the contingency attending the construction of the deep river foundation of the cantilever bridge, even waiving the absolute necessity of carrying this foundation to rock, is enough to balance a part of the greater cost of the suspension bridge.

The conclusion of this board is that of a board of bridge engineers acting in a professional capacity. While from such professional view they must pronounce the suspension bridge practicable, they do not in this conclusion give an opinion on the financial practicability and merit of either plan.

Before closing, your board desire to state particularly that the estimates have been made for comparative purposes and are not to be taken as a measure of absolute cost.

The Park & Lacy Machinery Company's Failure.

Oregon papers report that the Park & Lacy Machinery Company of Portland, importers and dealers in mining, wood and iron working and general mill machinery, failed on August 30. The principal creditor of the company is the London & San Francisco Bank of Portland, to whom the Park & Lacy Company are debtors to the extent of \$45,000, due on a promissory note executed September 7, 1893. The bank is said to hold collateral security in the shape of shares of stock in the Vulcan Iron Works, the value of which is unknown. Thomas Steel of the firm of Dittenhoefer, Haas & Co., was appointed receiver. Most of the property is in Oregon, but there are branch offices at Spokane and Seattle. The company owned a large saw mill plant at Snoqualmie, in King County, Wash., which was destroyed by fire a few months ago.

The assets of the Park & Lacy Machinery Company will probably amount to \$85,000 all told, while their indebtedness is estimated at \$125,000. The firm were incorporated under the laws of Oregon on July 18, 1888, with a capital stock of \$200,000, on which \$63 75 per share has been paid in. At that time the incorporated company succeeded the branch house of the San Francisco firm, B. T. Lacy, one of its members, retaining the principal share and acting as manager.

We are advised that the tin plate works of N. & G. Taylor Company, Philadelphia, are running full, with a good volume of orders, particularly for their special brands of roofing plates. Another tinning pot has been recently added, making the present equipment 23 sets.

The Foundrymen's Association.

The regular monthly meeting of the Foundrymen's Association was held at the Manufacturers' Club in Philadelphia on Wednesday, September 5, Vice-President Thomas Devlin occupying the chair.

The Executive Committee reported that the tariff bill had been settled, and, as far as foundry interests were concerned, it was not thought they would be affected directly, as the duty on cast iron pipe was 0.6 cent per pound, on general castings 0.8 cent per pound and on malleable iron castings 0.9 cent per pound. The committee had heard of a contract for a new market house that had been given out in Havana, Cuba, the amount of the contract being in the neighborhood of \$400,000. Under ordinary circumstances this contract would have been placed in the United States, but since the passage of the tariff bill reciprocity had been declared off, and the contract had been given to a concern in Belgium, the price being 1½ cents to 1¾ cents per pound. The freight rate from Belgium was found to be about 25 per cent. less than from Philadelphia and New York. In addition to this, which works against the American interest, was the fact that the steamship company had advanced the general freight rates 25 per cent. Here was an instance, the committee thought, where the tariff bill had caused the loss of a large contract.

In regard to the condition of the foundry trade the committee reported that while some foundrymen had their shops full of work, the larger number found themselves with few orders. The demand for new work seemed to be no better than it had been during the past several months, as customers were only buying to satisfy immediate wants. The impression the committee had formed was that it was too late in the year to expect a large increase and improvement in the business, but they thought next spring would find foundrymen full of orders, but at small margins.

Reports were next called for from the different sections of the Price Committee. The only report forthcoming was one from the cast iron soil pipe section. P. D. Wanner of the Reading Iron Foundry Company, Reading, Pa., in making the report said: "This trade has improved perceptibly since the cessation of tariff legislation, and prices have been advanced. The indications are that the foundries will all be busy to the end of the season. The pipe men can all stand a stiff advance to help them out partly on the losses sustained for the year. With your permission, I will add in a general way that we have good cause for congratulation at this meeting, coming after the passage of the tariff bill, the discussion of which has been the leading subject of our keenest and deepest anxieties at our meetings since the organization of this association. While many of us had sufficient courage to believe that the Wilson bill, as it passed the House, would not receive the support of the Senate, we all feared the final result and suffered intensely in body and estate from the incessant agitation and delay."

"The bill is a compromise measure and what we might have expected from a conservative body like the Senate. It is reasonably protective in its main features, and while it may not help the industries of the country materially it is not likely to injure many. Gentlemen, the tariff war is over; peace, pros-

perity and happiness will reign once more within our borders. We should therefore take fresh courage and brace up for what the future may offer, check off our losses and retrieve many a crushed hope, repair our shops, replace worn out tools and fixtures and get ready for the business revival bound to follow the panic and great depression. This may not follow by virtue of the new tariff bill, but because it ends the agitation and the uncertainty incident thereto. In my opinion we need not apprehend further disturbance from this source for years to come. The friends of President Cleveland and Mr. Wilson need not apologize or offer explanations for their threats to continue the tariff war—it is ended. It would be the waging of hostilities without soldiers; the guns are spiked, the arms stacked and the drums silenced. Its constant agitation for a period of all but seven years has given the American people enough for a generation to come and has definitely settled their determination to have a moderately protective tariff as long as protection will protect.

"The country requires rest and peace for business prosperity. One of the best illustrations we can point to for this we have in the first three years of Mr. Cleveland's first term. With a Democratic President and a Republican Senate, neither party could successfully pursue a policy injurious to the industrial, commercial or financial interests of the land, one being a check upon the other, and as a consequence the country was prosperous beyond all precedent.

"Under the dispensation of the laws of trade, however, the panic, with its consequent depression, was in order and inevitable, but had it not been for the interference of the tariff question it would have been of shorter duration and not so disastrous and widespread in its effects. But it is past now. Let us be thankful and rejoice and make merry over its grave."

Treasurer Thompson submitted a report showing a balance in hand of \$62 98, all bills being paid.

The secretary announced that J. B. Nau of Allegheny, Pa., had expected to be present to read a paper on "The Herbertz Cupola," a cupola in which was used a steam jet instead of a blower. He, however, had received a letter from that gentleman explaining his inability to attend and stating that he would endeavor to be present at a future meeting with plans and other details.

T. H. Stackhouse and Thos. Hacker were then introduced to the meeting by Secretary Evans as representatives of the Mutual Automatic Telephone Company of Philadelphia, the company seeking to introduce a new telephone system in that city. Mr. Stackhouse then addressed the meeting at some length in explanation of the system and its advantages. A committee of three members of the association was appointed by the chairman to investigate the system and report at the next meeting.

The secretary then called the attention of the meeting to some cast steel billiard balls lying on the table. The balls, he said, were made by Peter Ostberg, Stockholm, Sweden, and had been sent to the Union League Club, Philadelphia, by Pedro G. Salom, who was at one time connected with the Standard Steel Castings Company of Chester, Pa. The balls were of the same weight as ordinary ivory balls of the same size, and cost about \$2 each, or about one-quarter the cost of ivory balls. The castings were made with a

core, the holes being afterwards plugged and the casting finished in a lathe. The thickness of the casting in its finished state was said to be $\frac{1}{16}$ inch.

The subject "Core Ovens, Their Proper Shape, Draft and Economy," next came up, and a long discussion ensued. Many ovens were described and experiences related. Ovens heated by steam were conceded to be best for small cores. In regard to larger cores direct heat seemed to be the general practice, with provision for thorough ventilation of the ovens. Among those taking part in the discussion were Messrs. Flagg, Matlock, Bancroft, Wright, Register, Glover, Bauer, Messick, Wanner, Rankin, Devlin and Harkins.

The meeting then adjourned.

New Tin Plate Works at Middletown, Ind.

The plant of the Irondale Steel & Iron Company, which was located at Anderson, Ind., was burned to the ground on November 1, 1883. The owners of the plant, about March 1, 1894, began to rebuild at Middletown, Ind., having secured the exclusive right to about 4000 acres of natural gas territory and also having received a very considerable bonus from the citizens of the town. The plant at Anderson was exclusively adapted to the production of light iron and steel sheets for the trade. In the erection of the new mill a complete change was made, and the plant was rebuilt as a modern tin plate mill. As such it is considered to be one of the best equipped and most modern plants in the country. The machinery was put in operation for the first time on August 31, manufacturing black plates for tinning. The mill will run for about 60 days on this product, having its output sold for that time, after which tin plate will be regularly turned out.

The works are located upon a mill site of eight acres, immediately adjoining the right of way of the P. C. C. & St. Louis or Panhandle Railroad, from which side tracks have been run into the grounds, so that the handling of material both in and out is accomplished with the least possible labor. The buildings of the plant consist of an iron mill building, 100 x 200 feet, erected by the Pittsburgh Bridge Company, covering the rolling mills, and a brick and iron building, 50 x 200 feet, covering the tin house and pickling room. The hot mills are worthy of special notice, as they are the heaviest mills that have ever been used in tin plate work. The housings weigh 22,000 pounds each, the rolls being 24 inches in diameter with 19-inch necks. The entire equipment of six hot mills and cold rolls, together with doubling shears, finishing shears and roll lathe, was furnished by the Totten & Hogg Steel & Iron Foundry Company of Pittsburgh, their Mr. Freeman being upon the ground during a large part of the construction. They also furnished a 600 horse power Etna engine, which is used in addition to the large engine transferred from the old plant at Anderson. Much credit is given the Totten & Hogg Company for the superior workmanship upon all the machinery they have furnished. The pickling machine is of the Gray pattern, but is a very considerable improvement on the Welsh machine. It was built by the Elwood Iron Works of Elwood, Ind., who also furnished

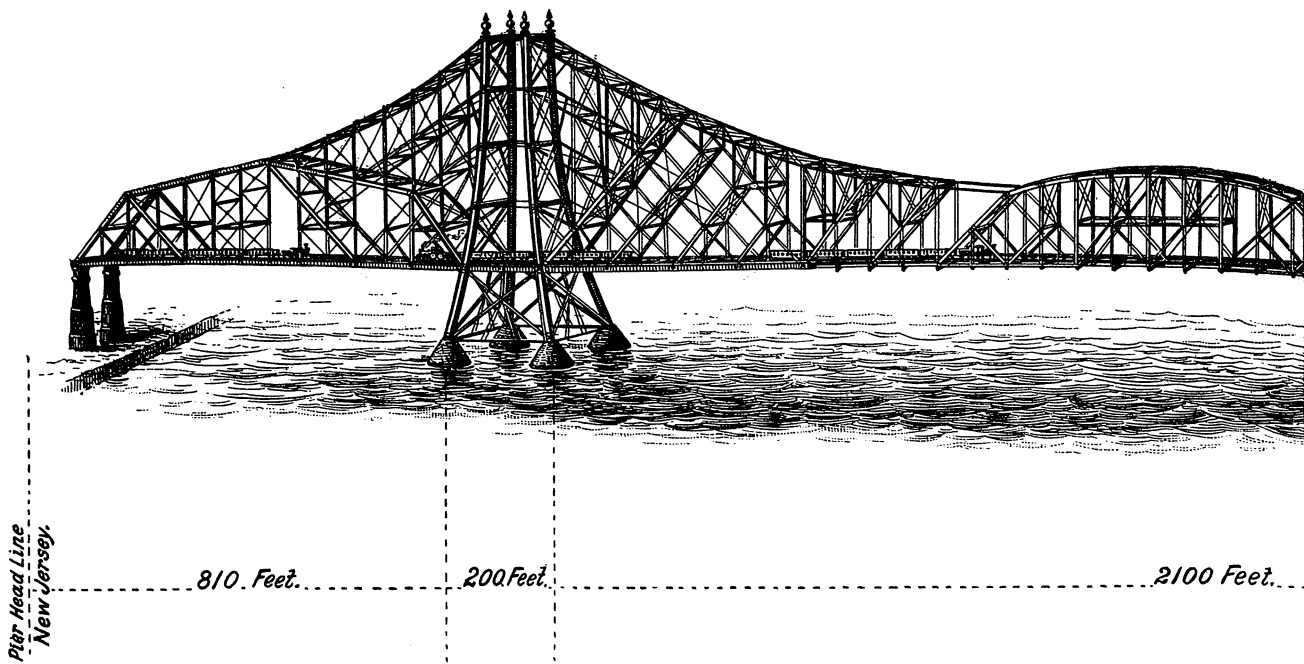
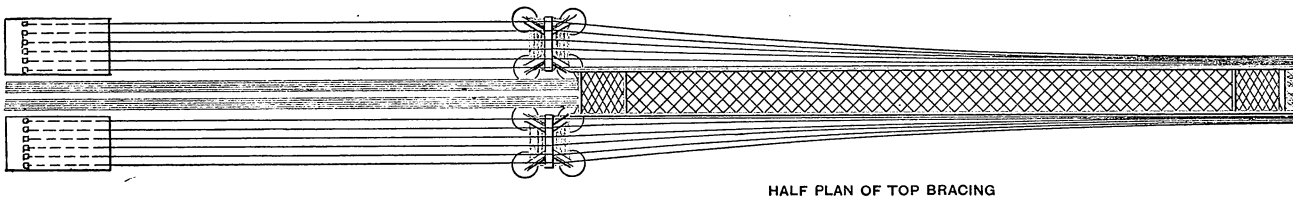
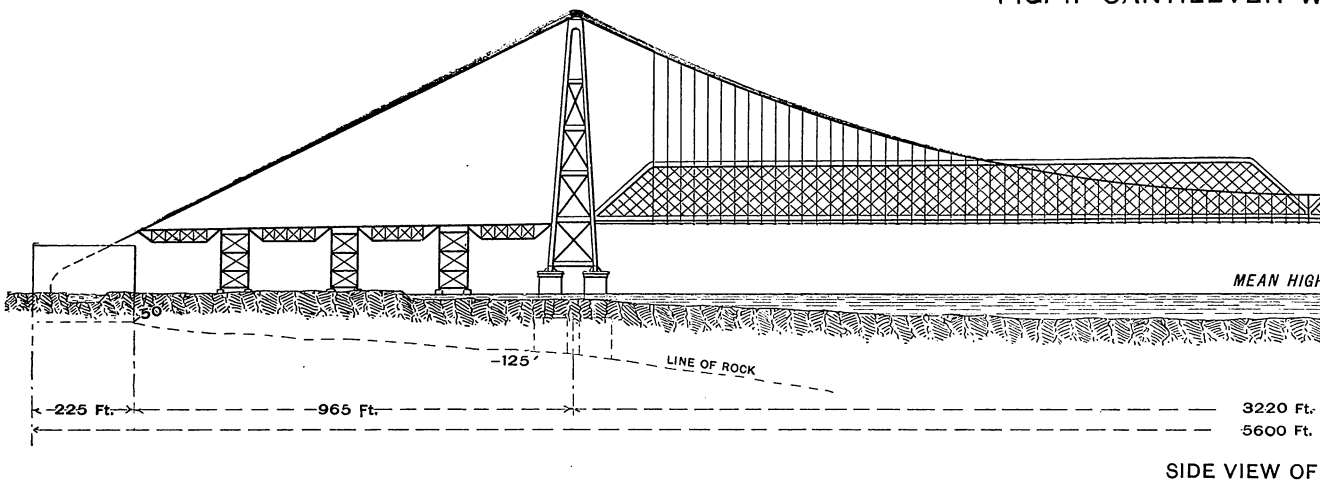


FIG. 1.—CANTILEVER W



PLAN OF B

FIGS. 2 and 3.—SUSPENSION BRI

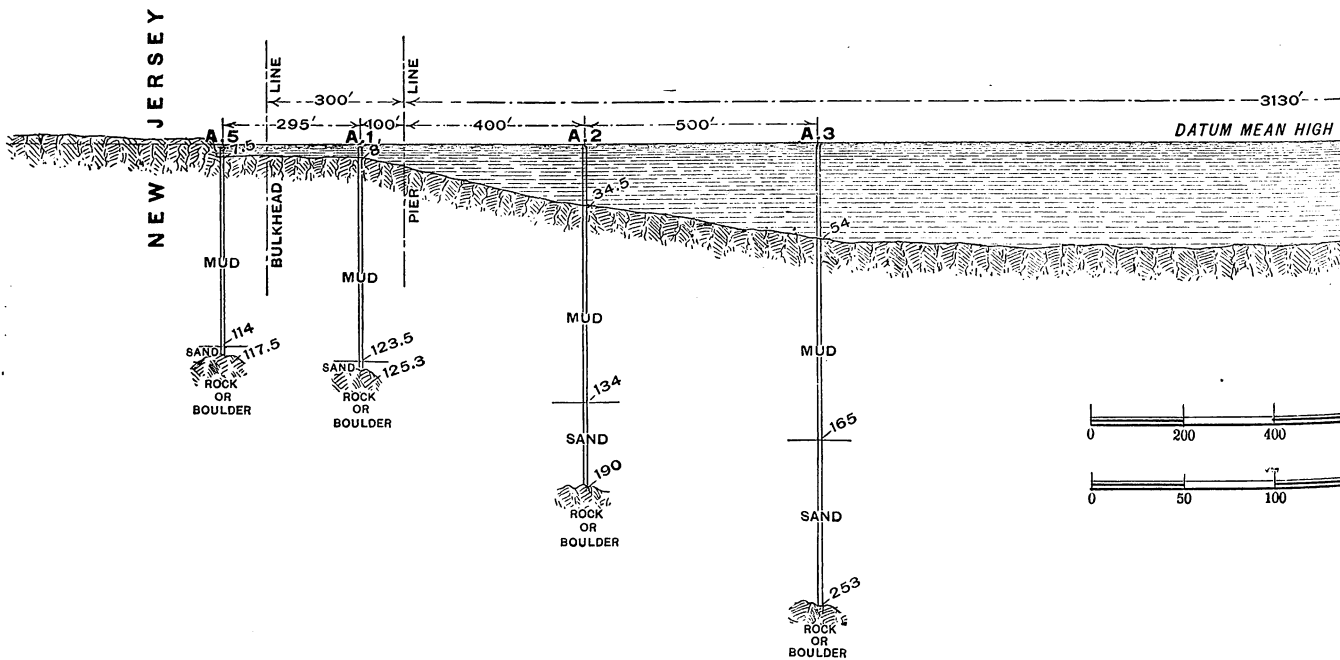
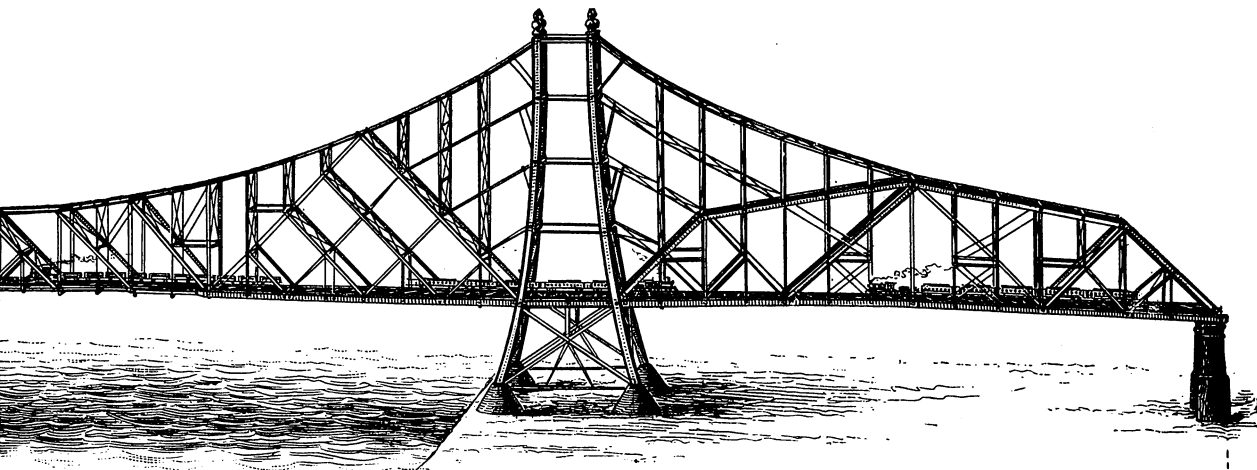


FIG. 4.—PROFILE SHOWING BO
TO BRIDGE THE HUDSON

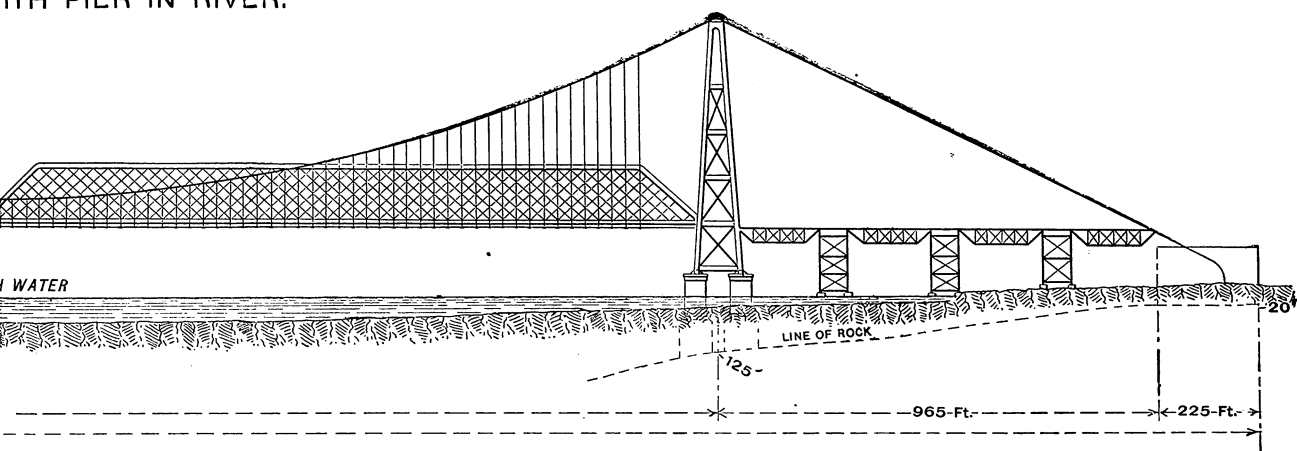


Pier Head Line
New York.

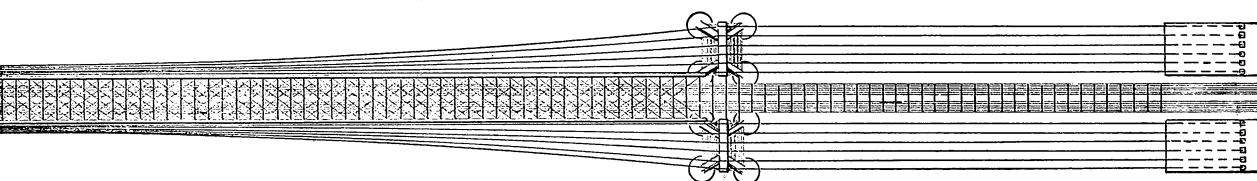
200 Feet.

810. Feet.

WITH PIER IN RIVER.



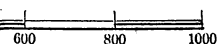
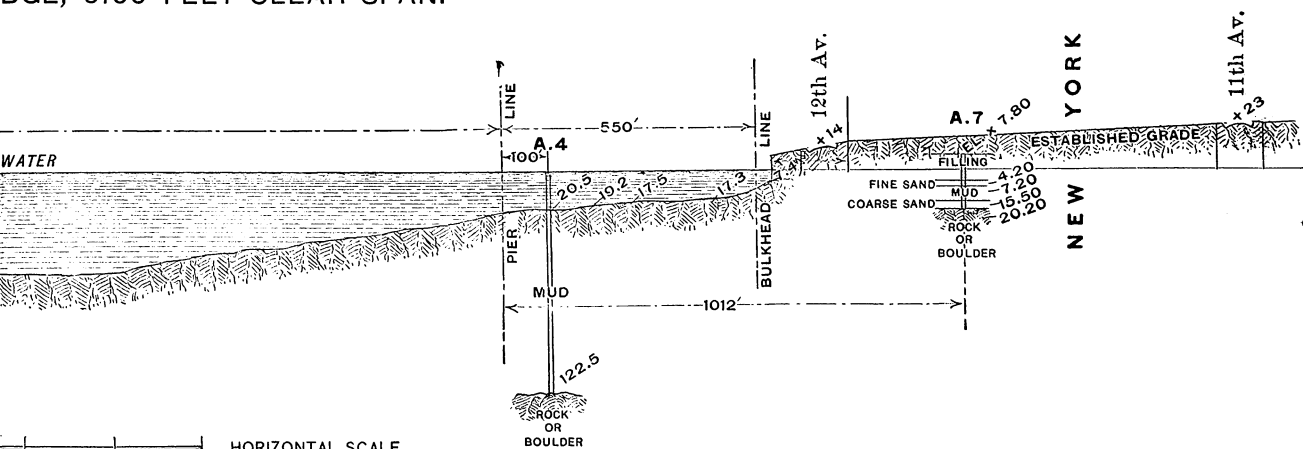
BRIDGE



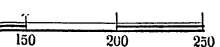
HALF PLAN OF FLOOR

BRIDGE

BRIDGE, 3100 FEET CLEAR SPAN.



HORIZONTAL SCALE.



VERTICAL SCALE.

RINGS ON LINE OF BRIDGE.

N RIVER AT NEW YORK.

the tinning pots, which are similar in general design to the Thomas & White pot.

At present the company are rolling plates from tin plate bars, but the design of their plant contemplates the addition of a bar mill which they have already on the ground. They will then purchase 4 x 7 steel billets and draw these down to tin plate bars.

The tinning house contains eight stacks for the manufacture of bright and terne plate. It is the intention of the company to add two more stacks specially adapted to fine charcoal plates.

The arrangement of the mill is designed to facilitate the handling of material with the least possible labor. The raw material comes in at one end of the

\$14,700 on an importation of iron ore, which was in bond at Sparrow's Point, Md., and which has been withdrawn since the new tariff went into effect.

Polishing and Buffing Machines.

Two new polishing and buffing machines are being built by Cutter, Wood & Stevens of 131 Pearl street, Boston. The spindle which carries the polishing wheel overhangs, or is offset from the vertical center line of the machine to such an extent as to allow unusual clearance for pieces of awkward dimensions. This is especially so with the long arm polishing and buffing lathe, Fig. 1, on which such work as

other hand, who have established trades in their specialties, are, as we have previously stated, in a much better position. The lower duty on tin plate is in a measure prejudicial to the American industry, but there is not the slightest prospect that the tin plate trade which is now established here will ever be recovered by Wales.

Nickel Steel Shields.

A Washington press dispatch reports as follows on an interesting and important competitive test made last week at the Indian Head proving ground, with the object of determining the best material for shields for the secondary battery of war ships:

These shields are intended principally for the protection of the gunners of the 6 pounders, and usually are not more than 1 inch in thickness. At present they are made of common steel. It was thought that a more invulnerable material could be discovered, and the ordnance experts believed that a steel with about 2 per cent. of chromium would be the best composition.

Four plates were fired upon in this competitive test—one of nickel steel, another of chrome steel, a third of manganese and a fourth of copper. The last mentioned plate was furnished by a Michigan man, who believed that he had discovered a valuable method of tempering copper. The trial at Indian

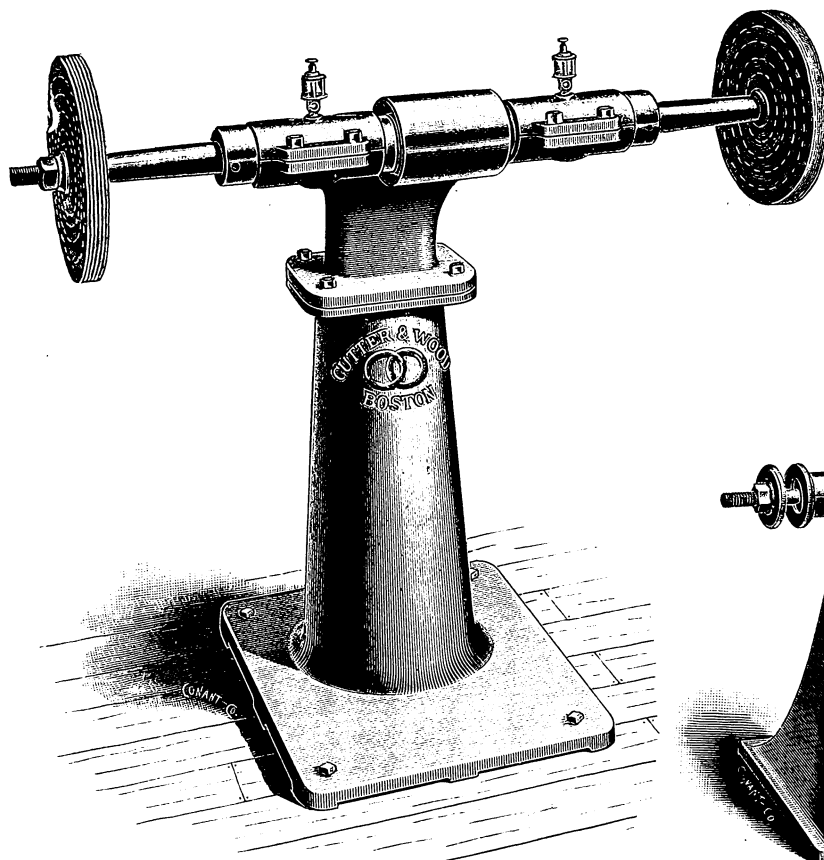


Fig. 1.—Overhanging Polishing and Buffing Lathe.

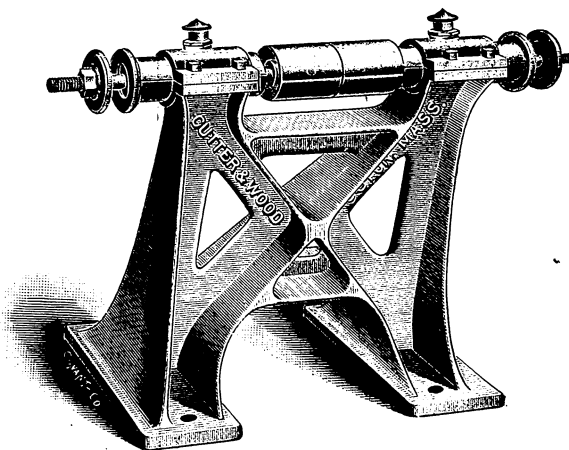


Fig. 2.—Offset Polishing and Buffing Machine.

mill, is taken to the hot mills and goes on through the mills to the pickler and cold rolls and round through the tinning house to the shipping switch, the whole system being formed in the shape of the letter U. Narrow gauge tracks are laid throughout the works.

The product of these works will be approximately 4000 boxes of 14 x 20 tin plates per week, but for the time being the tin house will not operate to its full capacity, and a considerable portion of the product will be sold in the form of black plates.

The company have established their general office in room 1023 The Rookery, Chicago. This will be the headquarters of Harold O. Crane, secretary and treasurer. The other officers of the company are as follows: George A. Laughlin, president, and John F. Whitelaw, vice president, both of Cleveland, Ohio, and L. B. Jackson, works manager at Littleton, Ind.

A Baltimore dispatch says that the Pennsylvania Steel Company saved

bicycle frames, lamp fixtures, office railings, &c., may be done. The offset feature on the smaller machine is not so marked, although it has ample clearance for the class of work for which it is intended. It is a substantial lathe, capable of carrying heavy polishing wheels or cloth buffs for heavy work.

An erroneous notion has got abroad that in a recent article referring to the difficulties in the way of the smaller dipping concerns under the new tin plate tariff we intimated that the future of the American tin plate industry was exceedingly dark. Lest this impression should gain further credence, we wish to state very plainly that our remarks were confined to the smaller works who are severely handicapped by the new duties on black sheets and tin plates. As a matter of fact, many of these smaller works have closed, and their proprietors express little hope of re-opening unless advantageous arrangements can be made with domestic black sheet mills. The larger firms, on the

Head, however, showed that a plate made of copper was easily penetrated by the 1-pounder shell used at 1000 feet velocity. In fact, the ordnance experts believe that such a plate can be perforated by a 1-pounder shell at 650 feet velocity.

The manganese was much better than the copper plate. The chrome steel plate was second best, but did not rank in the result as highly as was anticipated. The plate which proved itself most suitable for the purpose was the nickel steel plate, a composition which survived the tests in the searches for gun, projectile and heavy armor material. It is likely that the shields hereafter furnished the navy will be of nickel steel. They are much better than the simple steel plates now used.

The Bureau of the American Republics reports that the exportation of wheat from Argentina in the past four months was 26,000,000 bushels, an enormous increase over her previous returns. Besides this exportation of

wheat, Argentina exported in the past four months 10,544 tons of corn, 52 063 tons of linseed, 64 tons of oats and 361 tons of barley. The flocks are reported to be in excellent condition and the next wool clip promises to be large and fine.

Iron Trade Statistics.

James M. Swank, secretary of the American Iron and Steel Association, has just issued his annual report showing the production of iron and steel for the year 1893. The following summary covers the statistics dealt with:

Production of Iron and Steel.

	1892. Gross tons.	1893. Gross tons.
Pig iron.....	9,157,000	7,124,502
Spiegeleisen, included in pig iron.....	179,131	81,118
Bar, rod, hoop, skelp and shaped iron and steel.....	3,661,268	3,028,769
Iron and steel wire rods, included above.....	627,829	537,272
Plate and sheet iron and steel, except nail plate.....	751,460	674,345
Tin plates—year ended June 30.....	13,646,719	99,819,202
Iron and steel cut nails.....	4,507,819	3,048,933
Iron and steel wire nails.....	4,719,524	5,041,945
	Gross tons.	Gross tons.
All rolled iron and steel, including nails and excluding rails.....	4,613,970	3,839,227
Bessemer steel rails.....	1,537,588	1,129,400
Open hearth steel rails.....	3,819	968
Iron rails.....	10,437	6,080
Total production of rails.....	1,551,844	1,136,458
Street rails, included above.....	111,580	133,423
Bessemer steel ingots.....	4,168,435	3,215,656
Open hearth steel in- gots.....	669,889	737,890
Crucible steel ingots.....	84,709	63,613
Blister and "pat- ented" steel.....	4,548	2,806
All kinds of crude steel.....	4,927,581	4,019,995
Ore, pig and scrap blooms for sale.....	9,114	7,469
Value of imports of iron and steel.....	\$33,882,447	\$9,667,364
Value of exports of iron and steel.....	\$27,900,862	\$30,159,150
	Gross tons.	Gross tons.
Iron ore.....	16,296,666	11,587,629
Imports of iron ore.....	806,585	623,951
Total consumption of iron ore.....	17,400,000	13,480,000
Shipments of anthra- cite coal from the mines in Pennsyl- vania.....	41,893,321	43,089,537
Imports of anthracite and bituminous coa. Exports of anthracite and bituminous coal.....	1,138,661	1,149,027
Total domestic pro- duction of coal.....	2,497,325	3,658,378
Production of coke.....	160,115,242	182,814,977
Iron and steel ships built in the year ended June 30.....	12,010,829	Net tons. 4,477,580
Miles of new railroad completed.....	55	65
Total number of miles of railroad, December 31.....	4,648	2,828
Immigrants in the year ended Decem- ber 31.....	175,204	177,753
	547,060	495,030

Open Hearth Steel.—The statistics of the production of open hearth steel in the United States include steel made in the open hearth by the basic process, which we have not undertaken to separately classify. Direct castings are included with ingots. The production of open hearth steel ingots in the United States in 1893 was 737,890 gross tons, against 669,889 tons in 1892, 579,753 tons in 1891, and 513,232 tons in 1890. There was an increase of 68,001 tons, or over 10 per cent., in 1893 as compared with 1892.

The production of open hearth steel in 1893 in New England, New York and New Jersey amounted to 42 350 gross tons; in Pennsylvania to 616,516 tons, in Ohio to 50,385 tons and in

the other Western, Pacific and Southern States to 28,639 tons. The open hearth steel made in 1893 was produced by 64 works, located in 11 States—Massachusetts, New York, New Jersey, Pennsylvania, Alabama, Ohio, Indiana, Illinois, Michigan, Missouri and California. The total number of completed open hearth steel works in the United States, at the close of 1893, was 81, with 189 furnaces, and one plant was being erected. The quantity of open hearth steel rails produced in 1893 was only 968 gross tons, California, as usual, making the larger part.

Crucible Steel.—The production of crucible steel in the United States in 1893 amounted to 63,613 gross tons, against 84,709 tons in 1892, 72,586 tons in 1891 and 71,175 tons in 1890. There was a decrease in 1893 of 21,096 gross tons, as compared with 1892, or over 24 per cent. The crucible steel produced in 1893 was made in 11 States—Massachusetts, Connecticut, New York, New Jersey, Pennsylvania, Maryland, Tennessee, Indiana, Illinois, Michigan and Missouri. Of the total production of 63,613 gross tons of crucible steel in 1893 New England contributed 1389 tons; New York, 3925 tons; New Jersey, 4473 tons; Pennsylvania, 51,704 tons; the Western States, 1942 tons; and the Southern States, 180 tons.

Miscellaneous Steel.—The production of steel in the United States in 1893 by various minor processes amounted to 2806 gross tons, against 4548 tons in 1892, 4484 tons in 1891, and 3793 tons in 1890. Blister, puddled and "patented" steel, including "patented"

States.	1892. Gross tons.	1893. Gross tons.
Maine.....	6,005	6,866
New Hampshire.....	5,100	2,900
Massachusetts.....	137,882	95,782
Rhode Island.....	18,325	13,497
Connecticut.....	31,574	29,975
New York.....	134,069	128,675
New Jersey.....	106,816	88,232
Pennsylvania.....	3,302,506	2,862,833
Delaware.....	37,213	32,499
Maryland.....	114,594	135,088
Virginia.....	45,616	34,394
West Virginia.....	87,955	76,352
Kentucky.....	51,232	40,303
Tennessee.....	13,016	8,544
Georgia.....	2,902	.....
Alabama.....	33,316	21,542
Texas.....	235	.....
Ohio.....	888,793	639,884
Indiana.....	160,596	149,055
Illinois.....	743,635	407,070
Michigan.....	43,887	13,932
Wisconsin.....	90,405	71,416
Minnesota.....	5,429	6,000
Missouri.....	30,156	28,103
Iowa.....	2,829	1,677
Colorado.....	31,079	43,643
Oregon.....	1,810	1,522
Wyoming.....	7,446	6,290
California.....	38,840	23,581
Totals.....	6,165,814	4,975,665

Pennsylvania made 57.5 per cent. of the total production of rolled iron and steel in 1893, 53.5 per cent. in 1892, 56.4 per cent. in 1891, 58.5 per cent. in 1890, 57.4 per cent. in 1889, and 55.7 per cent. in 1888; Ohio made 12.8 per cent. in 1893, 14.4 per cent. in 1892, 14.5 per cent. in 1891, 12.4 per cent. in 1890, 13.5 per cent. in 1889, and 13 per cent. in 1888; and Illinois made 8.1 per cent. in 1893, 12.1 per cent. in 1892, 10.9 per cent. in 1891, 12.4 per cent. in 1890 and in 1889, and 12.2 per cent. in 1888. No other State produced 3 per cent. in any year.

The total production of rolled iron and steel in the United States from 1888 to 1893 is given in detail in the following table:

Years—Gross tons.	Iron and steel rails.	Bars, hoops, skelp and shapes.	Wire rods.	Plates and sheets, except nail plate.	Cut nails.	Total. Gross tons.
1888.....	1,403,700	2,034,162	279,769	609,827	289,891	4,617,349
1889.....	1,522,504	2,374,968	363,851	716,496	259,409	5,236,928
1890.....	1,885,307	2,613,660	457,099	809,881	261,828	6,022,875
1891.....	1,347,176	2,644,941	536,607	678,927	223,312	5,390,963
1892.....	1,551,844	3,633,439	627,829	761,460	201,242	6,165,814
1893.....	1,136,458	2,461,497	537,272	674,345	136,113	4,975,665

steel castings, are embraced in these figures.

Total Production of Steel.—The production of all kinds of steel in the United States in 1893 was as follows: Bessemer steel, 3 215 686 gross tons; open hearth steel, 737,890 tons; crucible steel, 63,613 tons; all other steel, 2806 tons; total, 4,019 995 tons, against 4,927 581 tons in 1892.

Total Production of Rolled Iron and Steel.—In the following tables we give the production of the various forms of rolled products in 1892 and 1893, iron and steel being added together. By the phrase "rolled iron and steel" we include all iron and steel rolled into finished forms, as follows: 1. All sizes of iron and steel rails. 2. Plate and sheet iron and steel. 3. Iron and steel plates for cut nails and cut spikes. 4. Wire rods. 5. Iron and steel structural shapes. 6. Bar, bolt, hoop, skelp and rolled axles. Hammered axles and other forgings are not included.

The production of all iron and steel rolled into finished forms in the United States in 1893 was 4,975,665 gross tons, against 6,165 814 tons in 1892, a decrease of 1,190,129 tons, or over 19 per cent. Twenty-seven States rolled either iron or steel or both iron and steel in 1893. The following table gives the aggregate production by States of iron and steel rolled into all kinds of finished forms in 1892 and 1893, in gross tons:

Iron and Steel Rails.—The production of all kinds of rails, including light and heavy and street and mine rails, in the United States in 1893 was 1,156,458 gross tons, against 1,551,844 tons in 1892, a decrease of 415,386 tons, or 26.7 per cent. The production of 1893 was composed of 1,036,353 tons of Bessemer steel rails rolled by the producers of domestic ingots; 93,047 tons of Bessemer steel rails rolled from purchased blooms and from old steel rails; 968 tons of open hearth steel rails, and 6090 tons of iron rails. The production in 1893 was the smallest since 1885.

The total production of Bessemer steel rails in 1893 amounted to 1,129,400 gross tons, of which Pennsylvania made 728,231, tons as compared with 961,987 tons in 1892; Illinois, 233,697 tons, against 450,553 tons in 1892; and the remainder of the country, 167,472 tons, against 125,048 tons in 1892.

The rails reported to us which are definitely known to have been rolled for street and electric railways amounted in 1893 to 133,423 gross tons, against 111,580 tons in 1892, 81,302 tons in 1891, and 98,529 tons in 1890, an increase in 1893 over 1892 of 21,843 tons. Virtually all our street rails are now rolled from Bessemer steel.

The total production of all kinds of iron and steel rails in the United States from 1864 to 1893 has been as follows:

Years.	Gross tons	Years.	Gross tons
1864.....	299,437	1879.....	993,993
1865.....	34,118	1880.....	1,305,212
1866.....	384,623	1881.....	1,646,518
1867.....	412,596	1882.....	1,507,851
1868.....	452,423	1883.....	1,214,905
1869.....	529,988	1884.....	1,022,188
1870.....	553,571	1885.....	976,978
1871.....	692,619	1886.....	1,600,537
1872.....	892,857	1887.....	2,139,640
1873.....	794,712	1888.....	1,437,700
1874.....	651,262	1889.....	1,522,204
1875.....	707,600	1890.....	1,835,307
1876.....	785,383	1891.....	1,307,176
1877.....	682,776	1892.....	1,551,844
1878.....	788,112	1893.....	1,136,458

Plates and Sheets.—The production of plate and sheet iron and steel in 1893, excluding nail plate, amounted to 674,345 gross tons, against 751,460 tons in 1892, a decrease of 77,115 tons. Many of the plate and sheet mills of the country, especially in Eastern and Central Pennsylvania, roll skelp iron and steel of various sizes, the production of which is not included in our tables with plates and sheets, but with other rolled material.

The following table gives the production of iron and steel plates and sheets by States, not including nail plates, in 1892 and 1893, in gross tons:

States.	Gross tons.	Gross tons.
	1892.	1893.
New Hampshire.....	7,035	1,400
Massachusetts.....	12,179	10,185
New York.....	515,506	466,271
New Jersey.....	13,206	14,132
Pennsylvania.....	26,135	25,952
Delaware.....	3,989	2,625
Maryland.....	139,004	123,411
West Virginia.....	16,631	18,896
Kentucky.....	17,775	11,423
Alabama.....	751,460	674,345
Ohio.....		
Indiana.....		
Illinois.....		
Michigan.....		
Wisconsin.....		
Missouri.....		
Totals.....	751,460	674,345

Iron and Steel Structural Shapes.—Our statistics of the production of iron and steel structural shapes embrace the production of beams, girders, tees, channels and angles, but do not include plates, which are provided for under other classifications. The production of iron and steel structural shapes in 1892 and 1893 was as follows, in gross tons:

States.	Gross tons.	Gross tons.
	1892.	1893.
New England.....	2,624	1,738
New York.....	26,678	21,443
New Jersey.....	342,644	302,378
Pennsylvania.....	10,365	3,035
Alabama.....	23,215	22,834
Kentucky.....	36,211	13,905
Ohio.....	4,580	10,377
Indiana.....	7,640	11,597
Illinois.....		
Michigan.....		
Wisconsin.....		
Oregon.....		
Wyoming.....		
California.....		
Totals.....	453,977	367,301

Nearly all our production of structural shapes and of plates used for structural purposes in 1893 and recent years was of steel.

Wire Rods.—The production of wire rods in 1893 amounted to 537,272 gross tons, against 627,829 tons in 1892, a decrease of 90,557 tons. Nearly all wire rods are now made of steel. Pennsylvania made the largest quantity in 1893, with Ohio second, Massachusetts third and Illinois fourth in production. New York, New Jersey, Indiana and Connecticut also rolled rods last year.

Cut Nails.—Our statistics of the production of iron and steel cut nails and cut spikes in the United States do not embrace railroad and other spikes made from bar iron, wire nails of any size, nor machine made horseshoe nails. Cut spikes are included with cut nails.

Our total production of cut nails in 1893 was 3,048,933 kegs of 100 pounds each, against 4,507,819 kegs in 1892, a decrease of 1,458,886 kegs, or over 32 per cent. There has been a steady decline in the production of cut nails since 1886, in which year the maximum production of 8,160,973 kegs was reached. In 1893 our production of wire nails, as will be shown below, exceeded our production of cut nails by almost 2,000,000 kegs.

Ten States made cut nails in 1893. The following table shows the production of iron and steel cut nails by States from 1891 to 1893, in kegs of 100 pounds. We have added to the table the wire nail production for these years:

States.	1891. Kegs.	1892. Kegs.	1893. Kegs.
Pennsylvania.....	1,470,613	1,521,332	1,113,168
Ohio.....	1,408,449	1,261,813	768,031
West Virginia.....	768,648	429,243	330,859
Massachusetts.....	353,292	297,588	337,039
New Jersey.....	97,400	128,700	81,128
Illinois.....	107,475	96,007	224,060
Kentucky.....	248,854	247,107	177,648
Indiana.....	333,445	370,729	
California.....			
Colorado.....	164,000	155,000	17,000
Missouri.....			
Wyoming.....			
Total cut nails.....	5,002,176	4,507,819	3,048,933
Total wire nails.....	4,114,385	4,719,524	5,041,945
Grand total.....	9,116,561	9,227,343	8,090,878

The production of cut nails is declining rapidly in the Wheeling district, which embraces the nail mills in Ohio and Marshall counties in West Virginia and in Belmont and Jefferson counties in Ohio. There were 691,994 kegs of cut nails made in this district in 1893, against 1,180,213 kegs in 1892, 1,609,933 kegs in 1891, 1,744,385 kegs in 1890, 1,825,956 kegs in 1889, 2,137,845 kegs in 1888, 1,848,116 kegs in 1887 and 1,858,551 kegs in 1886. Large quantities of cut nails were once made in Allegheny County, Pa., but no cut nails have been made in this county since 1890, in which year only 52,536 kegs were made.

Wire Nails.—The production of wire nails in the United States in 1886 was estimated at 600,000 kegs. In 1887 the production was estimated at 1,250,000 kegs; in 1888 at 1,500,000 kegs; in 1889 direct reports from most of the works showed the production to be 2,435,000 kegs; in 1890 the production increased to 3,135,911 kegs; in 1891 to 4,114,385 kegs; in 1892 to 4,719,524 kegs, and in 1893 to 5,041,945 kegs.

In the following table we give the production of wire nails in this country by States in the last five years, in kegs of 100 pounds, as reported to us by the manufacturers:

Years—Kegs.	New England.	New York and New Jersey.	Pennsylvania.	Ohio.	Indiana and Illinois.	Other States.	Total. Kegs.
1889.....	110,000	170,000	816,000	944,000	46,000	349,000	2,435,000
1890.....	167,135	168,460	1,061,639	1,115,320	47,507	575,850	3,135,911
1891.....	193,668	128,159	1,460,252	1,659,396	381,950	290,980	4,114,385
1892.....	107,477	91,470	1,676,684	1,800,742	796,460	246,745	4,719,524
1893.....	75,108	147,930	2,177,495	1,556,160	802,106	283,146	5,041,945

The "other States" referred to in the table as making wire nails in 1893 were Alabama, Wisconsin, Missouri and Washington.

The wire nails made in 1893 were produced by 40 works, and the wire nails made in 1892 by 39 works. There

were 55 completed wire nail works in the United States at the close of 1893.

Allegheny County, Pa.—The following table gives the number of blast furnaces, rolling mills and steel works, and the production in gross tons of pig iron, steel ingots, and rolled iron and steel in Allegheny County, Pa., in 1892 and 1893:

Details.	1892.	1893.
Blast furnaces, number.....	26	27
Production of pig iron, gross tons.....	1,775,257	1,697,207
Rolling mills and steel works, number.....	62	63
Production of crucible steel ingots, gross tons.....	55,722	43,289
Production of all other kinds of steel, including Bessemer and open hearth ingots, gross tons.....	1,570,252	1,547,484
Total production of crude steel, gross tons.....	1,605,974	1,590,773
Production of rails, bars, bolts, rods, shapes, hoops and skelp, gross tons.....	1,188,727	1,019,503
Production of sheets and plates, gross tons.....	248,369	230,061
Total production of rolled iron and steel, gross tons.....	1,437,096	1,249,564

Iron Blooms and Billets.—The quantity of iron blooms and billets produced in forges directly from the ore in 1893 was 864 gross tons, against 2182 tons in 1892, 5290 tons in 1891, 7094 tons in 1890 and 11,078 tons in 1889. The production of wrought iron direct from the ore in forges is now confined to the Lake Champlain district of New York and to one primitive Catalan forge in North Carolina. The quantity of iron blooms produced in forges from pig and scrap iron in 1893, and which was for sale and not intended for the consumption of the makers, was 6603 gross tons. Of the pig and scrap blooms made in 1893 Pennsylvania produced 3167 tons, New Jersey and Maryland producing the remainder.

James B. Clow & Son, Lake and Franklin streets, Chicago, secured a contract last week for about 3000 tons of cast iron gas pipe from the Mutual Fuel Gas Company of Chicago. It is the intention of this company to lay pipe over the greater part of the city of Chicago in competition with the so-called gas trust. A great deal of pipe will be required for this purpose. The contract just taken by James B. Clow & Son will be filled at their own pipe foundry at New Philadelphia, Ohio, which has been idle for a long time, but will now be run at its full capacity.

The Wm. Cramp & Sons Company of Philadelphia, at their meeting last week, declared a quarterly dividend of 2 per cent. and an extra dividend of 10 per cent. on their capital stock, payable September 15.

It is amusing to note the mystification of rural editors over strike news

from the cotton mills at Fall River, Mass., which contain allusions to the mills of the Fall River Iron Works Company. This corporation for many years operated both an iron rolling mill and a cotton factory. The rolling mill was abandoned as an unprofitable enter-

prise and the machinery sold in 1887. The old name is retained for the corporation, however, and the rather unique condition exists of an iron company weaving cotton fabrics.

Trials of Dynamite.

The scheme to throw high explosives from tubes by means of compressed air was first seriously considered by the navy. In 1886 the department ordered the construction of a vessel to be fitted with three dynamite tubes mounted forward stationary and to be aimed by the ship's rudder. A favorable report on the system having been made by the Pneumatic Gun Board, the cruiser known as the "Vesuvius" was built by the Cramps. The first trial with the guns occurred in 1889. Three shots were fired for range and 15 for endurance. The report of the board says that no attempt was made to secure accuracy of practice, the trials being simply to meet the contract requirements as to the rapidity of fire and the capacity of the system to maintain that rapidity for a given time. After considering the report the department ordered a second trial, the projectile to be used being a sub-caliber containing a 204-pound charge of guncotton and fitted with mechanical fuses. The result showed that a shell containing 200 pounds of guncotton or other high explosive could be thrown at least 1 mile by each of the dynamite guns constituting the vessel's armament. After considering maturely all the tests on the "Vesuvius" the Chief of Ordnance reports on the value of dynamite guns on war ships as follows:

"Each time the conclusion has been more or less favorable. Each report, however, has stated that the accuracy of the guns leaves much to be desired. It is manifest that the accuracy of a gun is its most important quality, and without a satisfactory degree of accuracy all other advantages are of minor importance. The difficulty in the pneumatic guns appears to center in the main valve which admits the air to the gun. At all ranges except the maximum the successful working of the gun demands that this valve should open and close in an exceedingly short time, probably a small fraction of a second. The difficulties encountered in accomplishing this have not been overcome. The department has already expended \$30,000 upon experiments with these guns without any decided improvement. Without entering further, at this time, into the merits of the system, the bureau recommends that further experiments be deferred until after the installation at Sandy Hook of the 15-inch guns now in course of construction for the War Department. In these guns the company promise to overcome the difficulties which exist in those of the "Vesuvius."

The trials of the 8 and 15 inch guns, which have just been completed at Sandy Hook, show that the defects in the valve have been remedied. The tests also proved that the guns could be rapidly handled and, what is of the most importance, that the shot could be delivered with certainty at any point within the range of the gun. The guns tried consisted of one 8-inch and two 15-inch. The contract, of which these guns form a part, was for seven dynamite guns, with ammunition and all required machinery. This was awarded to the Pneumatic Dynamite Gun Company of New York for \$395,000. The

conditions of the trials included range, accuracy, rapidity of loading and firing, proper action of the valve mechanism and so on. The 8 inch gun must be able to cover all ranges from 100 to 2600 yards with a shell containing 100 pounds of explosive gelatine, and from 100 to 3200 yards with shells containing 50 pounds. The 15-inch gun, with 50 pounds, must range from 100 to 5500 yards; with 100 pounds, to 4500 yards; with 250 pounds, to 3550 yards; with 500 pounds, to 3000 yards.

The rapidity of loading and firing varies with the amount of the explosive in the shell, but the time must not exceed three minutes for one shell of 500 pounds, or 40 minutes for ten consecutive rounds. For a shell charged with 200 pounds, two minutes are allowed, or 27 minutes for ten consecutive rounds. The rate of rapidity continues to increase with smaller charges, ten rounds in 20 minutes being reached. The 8-inch gun will be fired five rounds with 50 and five with 100 pounds in the shell, while the 15-inch will be fired three rounds with 50, eight with 100, ten with 200, and five with 500. The remaining gun of this caliber, if those tests are successful, will require only half a dozen proof rounds for testing its general working ability.

As an illustration of what the guns are capable of we may mention that in one test of the 15-inch guns five shots were fired at a range of 2000 yards. They all fell in the same straight line and the greatest variation was 39 yards. The time of flight of these projectiles was 17 seconds, 16½ seconds, 17 seconds, 17½ seconds and 17½ seconds. In the tests for rapidity the guns more than met the requirements. Five shots weighing 445 pounds were fired in 8 minutes and 45 seconds, the limit by the contract being ten minutes. The next lot was fired in 14 minutes and 40 seconds, the contract limit being 27 minutes. The third lot weighing 1140 pounds each was fired in 15 minutes and 36 seconds, the time allowed being 40 minutes. Twenty five shots were fired in 39 minutes 1 second, the contract time being 77 minutes.

The 15-inch gun and carriage weigh in the aggregate 52 tons, but the gun can be moved by the turn of a wheel or aimed in any direction. A telescope stands by the gun, and through this the gunner places his aim. The gun is moved by electricity. The compressed air is conveyed from the engine rooms by means of pipes to steel reservoirs, which are in chambers under the gun platform. From these reservoirs the air is conducted by means of large pipes up through the carriage to the trunnions, and from the trunnions through a large casing surrounding the barrel to the breech. Rotary joints are provided in this pipe at the pintle and at the trunnions, which allow the gun to be moved with freedom without breaking the continuity of the pipes and allowing any escape of air. A large valve near the breech controls the admission of air into the barrel. The opening and closing of this valve are automatic and completely under the control of the gunner.

A feature of the pneumatic system is the ability of the gunner to change the range without changing the elevation of the gun, by controlling the amount of compressed air that escapes at each discharge. When the discharging lever is pulled the large valve at the breech opens and remains open a sufficient time to allow a certain quantity of air to escape into the barrel; then the valve closes, before the projectile leaves the

muzzle, cutting off the escape of the air and retaining in the reservoir all that was not needed in propelling the projectile. The length of time the valve remains open is under control of the gunner, and by regulating the amount of air that enters the barrel he regulates the energy imparted to the projectile, and so can change his range without changing the elevation of the gun.

The system of keeping the reservoir always stocked with compressed air is a simple one. At each discharge of the gun the air pressure in the reservoir falls according to the adjustment of the valve. If the standard pressure in the reservoir is 1000 pounds to the square inch, one shot may reduce this pressure to 900 or 850 pounds, or any pressure not usually less than 800 pounds. By drawing from a storage reservoir beside the engine rooms, which contains air at a pressure of more than 1000 pounds to the square inch, the pressure in the gun reservoir may be speedily restored.

The system of loading the gun has been arranged so that there is no danger to be feared from the rapid handling of the projectiles. The projectiles are brought from the magazine in trays, which are run onto a loading carriage. This carriage runs on a circular track around the gun and brings the projectile into position for loading. A windlass is used for forcing the projectile into the bore of the gun. It requires four men to load the gun with a sub-caliber projectile, while the full caliber projectiles, which weigh as much as 1120 pounds, require six men.

San Francisco News.

The Clearing House changes continue to show an improvement every week. For the month of August they were \$56,840,314, as against \$49,298,818 for the same month in 1893, an increase of over \$7,000,000, or about 14 per cent. This is certainly encouraging. True, some of our merchants claim that the increase noted in the Clearing House exchanges came from the fact that the goods ordered during the great strike were coming along all the month and being delivered to customers, and that herein lay the secret of the unwonted activity shown by Clearing House business. But this will account for only a portion of the increase. It is evident, therefore, that there must have been an improvement in general business. This is generally allowed by the hardware trade, though denied in others. Most of our hardwaremen make good reports of the state of trade—that is, comparatively good, for no one pretends that the business of any part of this year has been anything like what we used to have in former years. Everything, however, has a better outlook than it had, and I do not doubt that our hardware and iron men will do a pretty fair fall business. That seems to be the opinion of the leading people in the trade. Our wheat, it is true, brings very low prices, but where there has been any crop the yield has made up to some extent for the lower price per quintal. There is a very keen competition between importers of machinery and some descriptions of agricultural implements, as also the manufacturers of bar iron and the importers. The manufacturers feel very bitter over the results. One of them the other day said that many of the prominent firms were merely agents for Eastern houses, whose interests were best subserved by crippling the iron and steel industry on the

Coast. The constant clash between the agents for Eastern houses and local manufacturers caused incessant friction in the trade, and, instead of a friendly and beneficial competition, dastardly and cutthroat methods were frequently resorted to. We thought that if our people possessed the loyalty that characterized the communities of other and in many cases less favored localities, our infant industries would be fostered and patronized and this city would in a comparatively short space of time take a position as one of the leading manufacturing cities of the Union. This gentleman represents the general feel-

but I do not think that there will be much if any difference for a long time to come, if ever. Low rates of freight from the East by rail and speedy transportation do not leave much success for foreign competition, unless, indeed, the great industries of the East should be themselves undermined by the recent changes.

The Wood Hydraulic Machinery.

A hydraulic riveting machine, hydraulic pressure reducing valve and a hydraulic automatic safety valve, de-

bolts may be reached for the purpose of removing the plunger or adjusting it in relation to its driving head. Back of the recess G is an annular recess which is ground to fit a packing sleeve or collar. The packing J is placed in annular end recesses formed in the sleeve. By tightening the bolts shown this packing may be squeezed so as to make a tight joint, preventing the water from passing into the front part of the machine. In this type of riveters it has been customary to cast the head or end of the casing A integral with the body, so that the plungers and other movable parts could only be withdrawn for inspection or repairs through the top of the casing. In this construction the head A' is removable. The parts may be easily removed and the cylinders inspected without trouble.

Inside of the smaller cylinder is located the supplemental plunger K, which is simply a duplication of the main plunger and driving head E F on a reduced scale. Unlike this, however, this supplemental plunger is (preferably) made in one piece with its driving head K', the projecting forward end of which forms a removable cylindrical cap, L, encircling the die holder M at the projecting outer end of the large driving head F. Generally, the large plunger with its driving head and die holder will be the one in use; but for certain kinds of work requiring a less degree of pressure the smaller plunger will be found to answer the purpose, in which case the die holder M is removed while tool holder L is attached to the projecting end of the driving head K', appertaining to the smaller plunger and the proper tool adjusted therein. It is optional which one of the two plungers is to be used for the time being, only one being used at a time, however, and the choice of the one depending upon the character of the work to be performed by the machine. The small plunger K has a removable follower head and is also provided with an annular flanged and recessed packing ring and packing, which is constructed and arranged with reference to its cylinder, precisely as the corresponding parts in the large plunger with reference to that cylinder. Within the supplemental plunger K K' is located the so called "push back" plunger N, which works in a small cylinder O, inserted into the small plunger from the front end of the casing and held in position by a packed nut P, screwed into a circular threaded opening in the front end of casing A, so that by removing this nut cylinder O with its plunger N may be removed for repacking or repairs when necessary. The object of the plunger N is, as its name indicates, to effect the rearward motion or back stroke of both the main and supplemental plungers, and to this end the cylinder O is always in communication with the pressure reservoir or accumulator, so that the pressure on its plunger can push back the main plunger E F and the supplemental plunger K K' when these are relieved from hydraulic pressure. When the main plunger is used it carries with it the supplemental plunger, but the exhaust valve of the small cylinder being open, it does not operate. On the other hand, when it is the supplemental plunger that is being operated, the main plunger will remain stationary within its cylinder, the discharge or exhaust valve of which is then open.

The next drawing, Fig. 2, represents a hydraulic pressure reducing valve. The valve is designed to be connected by piping with the working cylinder of

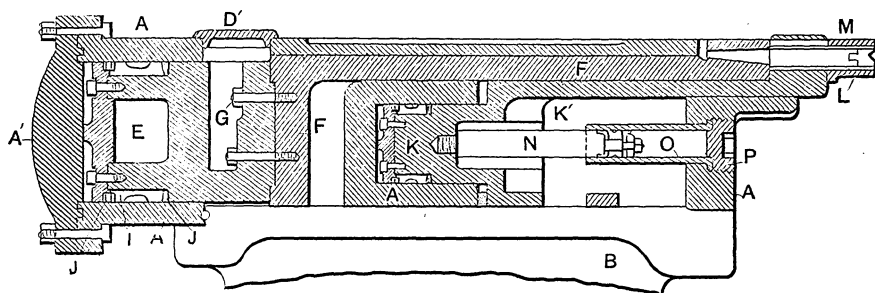


Fig. 1.—Hydraulic Riveting Machine.

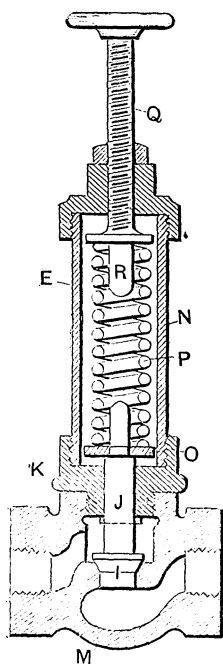


Fig. 2.—Hydraulic Pressure Reducing Valve.

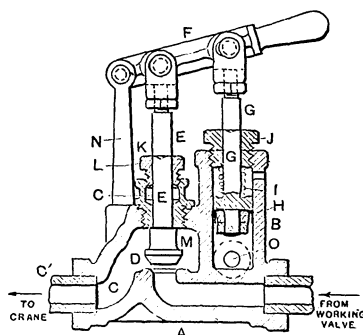


Fig. 3.—Hydraulic Automatic Safety Valve.

THE WOOD HYDRAULIC MACHINERY.

ing among our manufacturers, a feeling that has been intensified by the low rates of freight that have prevailed the past year or so by rail.

It is as yet too soon to have much to say as to the results of the new tariff on the trade of this city or on its manufactures. There has been a great increase in entries in bond. Where 30 entries a day used to be a fair average there have of late been 200 a day. This, of course, does not mean anything like what it would be in New York City, and means less to the lines of business represented by *The Iron Age* than to any other. Most of our supplies are obtained from the East, only a minimum from abroad. Of course there will be a greater chance for competition by foreign countries,

signed by William H. Wood of Media, Pa., is illustrated in the accompanying engravings. Referring to Fig. 1, A designates the cylindrical casing of the riveting machine, which is made of steel and securely mounted upon the base B. This casing contains two cylinders of different diameters, the rear-most one being the larger. The top of the casing over the large cylinder is cut away to form an opening which is closed by the cover D' to prevent any dirt entering. By removing this cover access may be had to the interior when it is desired to detach the driving head from the plunger. Fitting within the large cylinder is the main plunger E, to the forward end of which is bolted the driving head F. The plunger is made with a top recess, G, in order that the

a hydraulic riveting machine. The construction of the device will be understood from the following description of its operation:

Assuming that the machine is to be used to its full capacity—i. e., with a maximum pressure for riveting thick plates—the spindle Q is screwed down so as to seat the valve with a pressure a little in excess of the maximum pressure of the accumulator, and it follows that no water will pass out through the valve I into the exhaust pipe, the machine exhausting in the regular manner. But when the riveter is to be worked at less pressure, for riveting thinner plates or analogous work of a lighter character, the pressure within the working cylinder may be proportionately reduced by adjusting the spindle Q so as to relieve the valve from a certain amount of spring pressure, corresponding to or commensurate with the extent to which the cylinder is to be relieved. For example: If it is desired to work the machine at a pressure, we will say, of only 50 tons (the accumulator registering its maximum of 75 tons), then all that is necessary to do is to loosen the lock-nut, screw up the spindle and thus relieve the spring P until its pressure against the valve I is equal to or counterbalances a pressure of 50 tons on the area of the plunger within the working cylinder of the machine, and then again tighten down the lock nut so as to maintain the spindle and valve in this adjusted position. It follows that there will now be a constant outflow of water under pressure of 25 tons (viz: the excess of pressure, i. e., the difference of pressure between the accumulator and the working pressure in the cylinder) through the valve I into the exhaust. Should it be desired to still further reduce the working pressure, the nut is again loosened and the spindle is raised a little more, relieving the spring pressure on the valve commensurate with the reduction of working pressure within the cylinder, for example, for 50 to 30 tons, after which the nut is again fastened down as before. The outflow of water through the pressure reducing valve will now be increased, due to the added excess of 20 tons pressure, to which extent the working pressure on the plunger has been relieved, and there will be, as long as the machine is operated with a hydraulic pressure of 30 tons, a constant outflow of water from the cylinder into the exhaust at a pressure of 45 tons—i. e., the difference between the working pressure and the pressure on the water in the accumulator. By testing the spring and devising a scale based on such tests and marked off, for example, on the stem of the spindle Q, indicating the amount of relaxation required in the spring in order to effect a given reduction of pressure, the device may be operated with certainty and accuracy so that the working pressure of the machine may be regulated at will and instantly without interfering with the accumulator or the hydraulic connections of the machine.

The hydraulic automatic safety valve is shown in section in Fig. 3. This valve is intended to remove the danger and injury incident to the use of hydraulic machinery through the breakage of the supply pipes or other parts of the hydraulic connections by which water under heavy pressure is fed to the machine from the accumulator or pressure reservoir.

Normally, the parts of the device are approximately in their relative positions

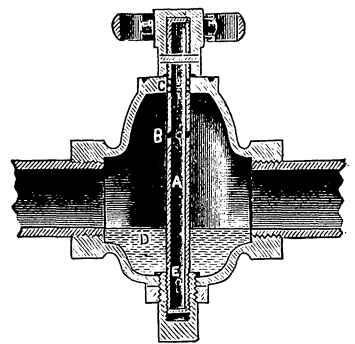
illustrated in Fig. 3, that is to say, the water under pressure flows freely in the direction of the arrows, into the working cylinder of the crane, accumulator or other machine to which the device has been applied. After starting the machine and as long as the hydraulic connections remain intact, the parts will be maintained in this position, because when the stop valve which governs the water supply from the accumulator is opened, the water enters the cylinder B by the pipe O and forces the piston H upward, compressing the spring I and lifting the lever F, and, with it, the valve stem E and valve D. But if a break should occur in the hydraulic main or other connections, or in the reservoir of the accumulator, the water pressure within the cylinder B will be instantly reduced, due to the leakage caused by the break, so that the tension of the spring I will preponderate over the water pressure on the under side of the piston, forcing the same down and, with it, the lever F and valve stem E, which results in the instantaneous closing of the valve D and stoppage of the flow of water through the device. The water contained in the cylinder B now flows back into the main through the pipe O, while the water in the throat leading to the valve D also flows back; but the water under its full pressure, as before the accident occurred, standing in the chamber M, and the working cylinder of the machine connected therewith cannot flow back, as the valve D is closed and the result is that there will be no collapse of the machine, but its plunger or plungers (as the case may be) will remain stationary in the position or at the elevation to which they had been raised just before the accident, instead of coming down suddenly and probably causing great damage. By then raising the free end of the lever E by means of its handle this water may be let out gradually through the valve D, thus slowly lowering the plunger of the machine to which the device is applied and avoiding all danger and injury, or it may remain closed until the pressure mains have been repaired.

The Brazil Locomotive Contract.—Flint & Co. of 64-68 Broad street, New York, will ship 8 of the 60 locomotives for the Central Railroad of Brazil on the steamer "Queensland" for Rio de Janeiro, sailing September 15. The freight of this installment of the smaller engines aggregates about 200,000 pounds. This order was placed with the Brooks Locomotive Works, Dunkirk, N. Y., June 2 last. Work was begun immediately. To economize time after their bid had been accepted, some of the specifications were transmitted by cable at an expense to Flint & Co. of over \$1500. While the work was in progress, to avoid errors and have a thorough understanding, the vice-president of the Brooks Company left New York, June 6, for Rio, and spent ten days there so as to insure the having of even the minor details exactly as those who were to use the engines wanted them, Flint & Co.'s instructions being to spare no effort to send the best that could be made according to their specifications. The Brooks official arrived back here August 15, having cabled while there some minor changes. In contracting for steamer freight the far-sightedness of cabling became apparent. The several steamer lines being pooled asked more than the shippers were willing to pay, and on mentioning the fact that 30 days had been saved in this

way finally secured rates, we are told, 30 to 40 per cent. lower, as there is but 30 days difference between sail and steamer to this port. Even now it is said this portion of the contract will be landed there about 60 days in advance of the requirements. This trip involved the crossing of the Atlantic twice each way to get to a port in our own hemisphere. It is sincerely to be hoped that a larger trade will lead to adequate and easy communication between North and South American ports for passengers, mail and freight, and the establishment of international banks that will save to this country the commission now paid principally to London for banking facilities. This order in full consists of the following passenger and freight locomotives: Five passenger locomotives, meter gauge, equivalent to 3 feet 3½ inches; 15 freight locomotives, 12-wheel, meter gauge, equivalent to 3 feet 3½ inches; 15 freight locomotives, 12 wheel, 1.60 m. gauge; 25 passenger locomotives, 1.60 m. Some of the boiler shells are 58 and 72 inches in diameter.

Cushman's Steam and Water Vaporizer.

The Cushman vaporizer is intended for moistening the atmosphere in works where dampness is required. In



Cushman's Steam and Water Vaporizer.

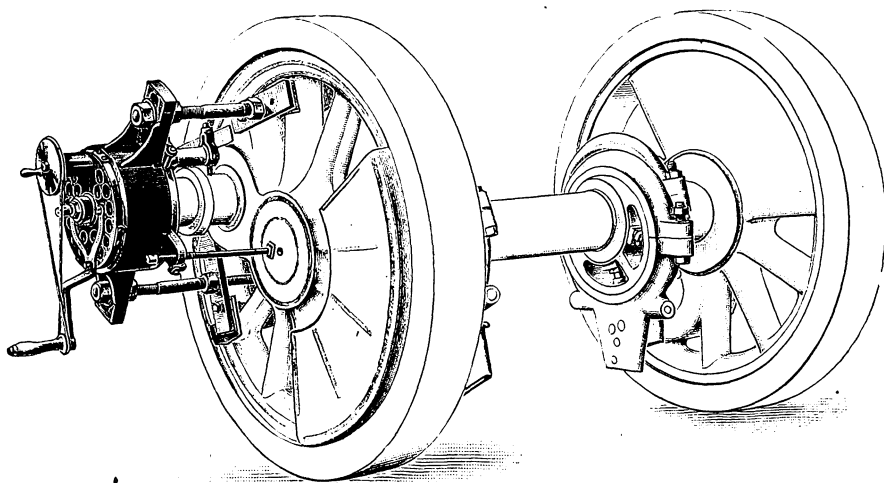
construction it is like an open valve with a water pocket below. The hollow spindle A is formed with three small holes, C, one above the other on each quarter, for outlets. Four larger holes, B, open into the steam chamber for the inlet of steam, and one small hole, E, is provided for the inlet of water from the pocket D. Since the steam is controlled at the outlet there is no condensation to cause dripping upon the floor. When first opening the vaporizer four small streams of dry steam are obtained. A further raising of the spindle admits water through the opening E, so that the desired degree of dampness may be obtained. The vaporizers are intended to be placed at every 20 feet in 1-inch pipe, located about 10 feet from each side wall and from 8 to 10 feet overhead. A steam pressure of from 15 to 100 pounds is used. This device is made by E. L. Post of 50 Cliff street, New York.

The Largest Plate—We are advised by Chas. H. Wellman, superintendent of the Wellman Iron & Steel Company of Thurlow, Pa., that that mill has recently rolled a plate that will shear to the following dimensions: 327 inches long, 120 inches wide, and 1½ inches thick. The ingot from which this plate was rolled weighed 21,000

pounds, and was made in the open hearth steel plant of the Wellman Iron & Steel Company. It is believed that this is the largest plate which has ever been rolled in the United States, and that there is no other mill fitted up to handle plates of this size and weight. The management believe that there is no other three-high mill in the world capable of producing so large a plate. The plate is intended for use on one of the new American iron steamers now being built at the Cramp shipyard.

Portable Crank Pin Turning Machine.

This portable crank pin turning machine will turn long or short pins either with or without collar. Since no offset tools are required, there is no springing of the tool. It can be set so as to run perfectly true with the original turning of the pin. For turning pins with two bearings an extension bar is used for reaching the inner bearing.



PORTABLE CRANK PIN TURNING MACHINE.

A large shell is used to carry the cutter and act as a frame and guide for the tool. The two large lugs on the shell are for clamping the device to the wheel; the two smaller lugs carry set screws that merely true it up and act as feet for it to stand on. A large center point screws through the center of the shell to bring the device true by entering the drilled center of the pin, and there are four jaws on the back of the inside shell that center the collar or flange of the pin. Inside the shell there is a second shell that revolves, carrying with it a tool post which is fed out and in by a screw, operated either by hand or the small belt shown. With this device not only the bearing, but the faces of the collars can be trued up. When it is desired to turn the inside bearing of a main pin an extension to the tool post is screwed into place, as shown in the engraving.

This machine, made by the Henry C. Ayer & Gleason Company, Betz Building, Philadelphia, will true pins from 4 to 7½ inches in diameter.

Referring to the recent publication in our columns of names of foundrymen prepared to furnish annealed gray iron castings, an additional name is that of I. S. Spencer's Sons, Guilford, Conn., who write that they have excellent facilities for doing this class of work.

THE WEEK.

The New Southern Railway Company, formed by reorganization of the Richmond & West Point Terminal and the East Tennessee, Virginia & Georgia Railway Company, have acquired in absolute ownership 4 500 miles of road, and by the reorganization have reduced the bonded indebtedness from \$135,000,000 to \$90,000,000, just one-third, and the fixed charges from \$7,500,000 per annum to \$4,500,000, a saving of \$3,000,000 per annum. The bonded indebtedness of the road is now less than \$20,000 per mile. A dispatch—said to be officially inspired—from Chattanooga, Tenn., asserts that the reorganization was effected by Drexel, Morgan & Co. of New York in the interests of the Rothschilds of London and Paris and the Vanderbilts of New York, and that these two families, Drexel, Morgan & Co. and J. S. Morgan & Co. of London, each own one quarter interest in the new company. The first

the Pacific Coast, of a lot of 1,000,000 cartridges, 45-70 caliber, by the Winchester Repeating Arms Company, New Haven, Conn., is reported. It is said to be a trial order.

State Factory Inspector Connolly, at Albany, N. Y., has requested the Attorney-General to commence action against the Buffalo Ice Company for failure to pay their employees weekly. The penalty is a fine of \$50 for each week's neglect to pay each employee.

Shipments of merchandise to the Southern States show a marked increase, both by land and water.

A report received at the State Department from United States Consul-General Williams, at Havana, shows that since January 1, 1894, the United States has taken 95.66 per cent. of Cuban sugar exports.

The July foreign trade statistics of the United States show, for the first time this year, an excess of imports over exports. The figures are: Value of domestic exports, \$51,639,463; value of imports, \$65,300,782. This excess, amounting to nearly \$14,000,000, is attributable largely to the enormous importations of sugar to avoid the increased duties under the new tariff law. Nearly 50 per cent. of the imports were food products. For the first seven months of this year the excess of exports over imports amounts to nearly \$56,000,000.

Contracts have been let for the first three miles of the Hennepin Canal, which is to form a link in connecting Lake Michigan with the Upper Mississippi. Contracts for 12 miles of the work are to be let this fall.

Grand Master Sargent of the Brotherhood of Locomotive Firemen, is of the opinion that "the Debs sympathy strike in Illinois gave organized labor a blow from which it will not recover in ten years."

British Board of Trade returns for August show that the imports decreased \$18,128,000 and the exports decreased \$4,360,000, as compared with those of August, 1893.

The statistics of the *Financial Chronicle* place the American cotton crop of 1893-94 at 7,527,211 bales, an increase of 810,089 bales over that of the previous year. Compared with the average of the seven previous crops, last season's yield shows an increase of 72,910 bales. The new crop will, it is estimated, exceed this good showing by quite 1,500,000 bales.

The extraordinary falling off in immigration into the United States this year is illustrated in the returns for the month of July last, issued by the Bureau of Immigration, which show that the number of immigrants was only 17,889, as compared with 47,719 in July of last year. The decline is most strangely marked in arrivals from Austria, Hungary, Italy and Russia. Several governments, notably that of Italy, have notified their intending immigrants of the unfavorable conditions for employment existing in all lines of industry in this country.

The *American Agriculturist*, in an article on "Farm Mortgages," says that the recent scare on this subject is without foundation in fact. The plain truth is that only a little more than one-fourth of the taxed acres in the country are mortgaged, and probably not one-fifth of the farms are so encumbered. The debt averages only \$8

annual meeting of the company will be held on October 2, at Richmond, Va., when bonds to the amount of \$120,000,000 on the entire property will, it is said, be authorized.

According to estimates given out by Mint Director Preston, at Washington, D. C., the total of gold coined in the United States during the fiscal year ended June 30 last was the greatest on record with the exception of 1881. Mr. Preston places the gold coinage of the year at \$99,474,912 50, made up of \$55,143,640 in double eagles, \$34,968,840 in eagles, \$9,287,180 in half eagles and \$75,252 50 in quarter eagles. Of this amount \$76,219,911.50 were coined in the Philadelphia mint, and \$21,637,000 in San Francisco. The mintage at New Orleans was comparatively insignificant. The increase in gold coinage has been due to the necessity of reducing the large supply of bullion in the treasury vaults into coin, to meet the drain on the Treasury caused by the panic.

Owing to the drought the Susquehanna River last week was lower than it has been in three quarters of a century.

It is said that the Chinese Government have asked American manufacturers to submit bids to their agents giving prices for 1,000,000 rounds of cartridges. A shipment to China, via

per acre on all the mortgages, and only \$2.33 on each acre taxed. An official report on the matter, just published, shows that in every hundred families who lived on United States farms in 1890, 47 owned free of incumbrance; 19 owned, but were mortgaged; and 34 hired their homes.

August's fire loss of the United States and Canada, as computed by the *Journal of Commerce*, aggregates \$10,432,800, which is a decrease of nearly \$3,000,000 from the figures of the corresponding month of 1893. So far the total fire loss for this year compares very favorably with that of the first eight months of last year, and exceeds by only a small margin that of the same period in 1892. The following comparative table of losses by months demonstrates the gratifying improvement that has taken place:

	1892.	1893.	1894.
January..	\$12,564,900	\$17,938,400	\$10,568,400
February..	11,914,000	9,919,900	11,497,600
March.....	10,648,000	16,682,350	9,147,100
April.....	11,559,800	14,669,900	11,540,000
May.....	9,485,000	10,427,100	10,777,800
June.....	9,265,550	16,344,950	8,282,300
July.....	11,530,000	12,118,700	16,307,000
August....	10,145,300	13,222,700	10,432,800
Totals..	\$87,112,550	\$111,324,000	\$87,453,000

There were 204 fires in August of a greater destructiveness than \$10,000 each, but none reached as great a loss as \$500,000. Of losses estimated at over \$100,000 nearly all were in the Western States, no very heavy Eastern losses being recorded.

The Government crop report for the month of September shows a decline of 5.7 points in the condition of corn from the month of August, and no less than 31.6 from July. The Southern States are the only quarter in which improvement is noted. There a good corn crop is certain, but in nearly all the great corn States its condition is poor. In eight of the Western corn States, out of an aggregate crop acreage of 40,900,000, over 15,500,000 acres of corn have been cut up for fodder or abandoned. The condition of wheat, on the other hand, is quite favorable, showing 83.7, against 74.0 last year. There has been a marked improvement in this cereal since July. In parts of the wheat region the crop is fully up to expectations, and in other parts the yield has exceeded anticipation. Oats, rye and barley compare favorably with the averages of last year.

The Quaker City is not to have elevated railroads at present. After a long and persistent struggle the syndicate of New York and Philadelphia capitalists, who had actually begun preliminary operations under charters granted by the State of Pennsylvania, have given up the effort to give Philadelphia an L system on account of the numerous obstacles placed in their way. A section of the road, already built, has been taken down and shipped away as old iron, and the whole project is definitely abandoned.

Canadian trade returns for the month of July show a considerable falling off as compared with the figures for July of last year. The value of exports was \$11,451,527, as compared with \$12,683,597, while imports declined from \$10,692,637 in July, 1893, to \$10,058,226 in July of this year. The duty collected exhibits a decrease of over \$250,000.

The Detroit street railroads have been purchased, it is said, by a firm of New York City bankers from Thomas Nevins of Orange, N. J.

Washington News.

(From our Special Correspondent.)

WASHINGTON, D. C., September 11, 1894.

Armor Plate.

There has been much inquiry as to the action the Department of the Navy will take in reference to the recommendations of the Congressional armor investigating committee particularly concerning the re-test of plates now in place on vessels and alleged to have been inadequately or irregularly treated. The report, it will be remembered, went into this part of the subject with great minuteness. At the Ordnance Bureau it is stated that as the resolution reported before becoming operative must have the concurrence of the Senate, no action can be taken with respect to its provisions until it shall have received that sanction. It was also stated that in addition to lack of authority the Department is without funds for such an expensive procedure, which would require an appropriation.

The erratic methods of the Carnegie Company in the manufacture of these plates, according to the conclusions of the committee, have so far received the indorsement of the Department as to very radically change the system of inspection and reports. The details have not only been increased but new instructions have been issued to the officers in charge, so that any work commenced for the Government will be uninterruptedly under the eye of an inspecting officer, and no part of this portion of the work will be trusted to employees of the company in the matter of recording the results of tests for use in Government reports.

When the almost perfunctory manner of performing inspection duty was first made known to the Department there was considerable of a flurry between the staff and the line to the extent of urging the greater fitness of officers of the Bureau of Steam Engineering, who are practical men, than officers whose duty is the handling of the ship. There was much force in what was urged by the experts of the Steam Engineering Bureau, but it was claimed in opposition that these inspections were not strictly technical, but a matter of surveillance of work carried on under defined specifications, and required no expert knowledge beyond what every efficient officer of the navy should possess.

It is very certain that the Carnegie employees will not find their work in the future under their armor plate contract such an easy task. The confidence of the Department has been badly shaken and during the remainder of its dealings with this company the most rigid observance of the requirements of the Government will be enforced.

Machine Guns.

In speaking of the trial of rapid fire guns under the auspices of the Bureau of Ordnance of the army some very interesting points of difference between the uses of machine guns in the army and navy were set forth. In the tests now going on under the Navy Department the merits of the gun for immediate adoption and use are being determined. In the army the sole object of the trials is to reach a conclusion as to the merits of the gun for a particular class of service required. *The Iron Age* presented exclusively at the time the official text of the report of the trials at the Washing-

ton Navy Yard and at the Indian Head proving ground of machine guns under the auspices of the board. That report has been sought after with great interest by military and naval representatives of foreign governments, by inventors and manufacturers in the same line.

These majority and minority reports are evidently being made the basis of some important improvements in the guns which were tried, and have stimulated considerable energy among parties who have made machine methods of loading and firing for land and sea service a study, as well as one of the mechanic arts.

The army trials have been conducted on a very different line of argument, so to speak. The reports on the guns tried have not yet been submitted, but instead of being a statement in reference to their work in general and in comparison with a group, each gun will be discussed from the standpoint of its own efficiency for certain service, for instance, to operate from a fixed point for flank defense in event of a land attack. These guns would be placed in position for sweeping the ditch or enfilading the glacis. The merits of each gun for this work will be reported.

Another class of guns will be tested and recommended on their merits for field service. It has been found that every gun has some merit, and each will be scaled by percentage of merit under the different heads of efficiency already presented in this correspondence. These reports will be held in the Ordnance Department for reference and selection. Whenever the equipment of a fortification is required, the requisition will be for guns for certain defined work in the batteries as a whole. The class of rapid fire gun furnished will be determined by these recommendations by the Chief of Ordnance.

In referring to the defense of a work from the sea some very interesting scientific distinctions were drawn, on the subject of projectiles. For instance, the navy armor piercing shot is shorter and thicker and driven at a very high velocity for quick and effective results. The army shot is longer and less thick and is carried at not such a high velocity, but with maximum results. Among the reasons given for this is the fact that the army shot has its initial movement from a fixed point, and its point of impact, except in most exceptional cases, as in a narrow waterway, is never less than $\frac{1}{4}$ mile. On the contrary, a shot from the deck of a vessel, besides starting from a point in motion, may be delivered at an object within almost muzzle range. These considerations are prominent in the calculations of the experts of either branch of the service.

The army still use the Holtzer shot turned out by the Midvale Company, as the best for their class of work, while the navy find the Carpenter the best for their purposes. The Carpenter people are now engaged in perfecting a special shot for the peculiar service of the army. During the fall months some important experiments and tests are contemplated both in guns and defensive equipment for land defenses and ships.

The successful experiments recently made with the electric locomotive at Nantes, France, have encouraged the Western Railway Company of France to order two of these engines, to run between Paris and Havre. They can run without any change in the rails at a speed of 60 miles an hour.

The Iron Age

New York, Thursday, September 13, 1894.

DAVID WILLIAMS, - - PUBLISHER AND PROPRIETOR.
CHAS. KIRCHHOFF, - - EDITOR.
GEO. W. COPE, - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS, - - HARDWARE EDITOR.
JOHN S. KING, - - BUSINESS MANAGER.

The Struggle for Southern Business.

The Western merchants and shippers have not found the Southern railroad companies readily complying with the dictum of the Interstate Commerce Commission fixing a new basis of maximum rates from New York and Chicago to the South. When the Interstate Commerce Commission rendered their decision it was hailed as an important victory for Western interests. It would have been if the decision of the commission had been accepted by the railroads. But they have refused to do so, and on being pressed by the Cincinnati and Chicago merchants to make new rates to Southern points the Louisville & Nashville Railroad Company appealed from the decision of the commission to the United States Court. A master in chancery was appointed to take testimony. The contention is that the Southern roads are charging a much lower rate on the same kind of traffic under the same circumstances and conditions from points in the East than they do from points in the West, thus making it practically impossible for Western merchants and shippers to compete for Southern trade. The past week the Master in Chancery has been receiving at Chicago the depositions of railroad freight experts who make their headquarters in that city. One of the most interesting witnesses was Chairman Midgley of the Western Freight Association. Among other questions he was asked whether the average receipts per ton per mile, or the estimated cost of carrying 1 ton 1 mile, or the tons carried per mile of line of any particular railroad, either singly or together, form a basis for determining what are reasonable rates in and of themselves to be charged by that railroad for the transportation of classes two to six of the Southern Railway & Steamship Association classification. In answer to this question Mr. Midgley read the following answer:

The conditions that surround the traffic tributary to railroads throughout the West and South and other apparently sparsely settled portions of the country are seldom alike, or nearly so, during two consecutive years; hence the results obtained from one year's operations would rarely be of service as a basis for the future. Take, for example, the present outlook: The presumption is that there will be, compared with former years, but a small surplus of corn or other coarse and cheap freight to transport; so, also, if the drought that has afflicted the country should continue there will be a serious reduction in the amount of dairy products and of dressed meats that will be offered for transportation. Those considerations will materially change the average receipts per ton per mile, the

average cost per ton per mile and the gross tonnage carried per mile. Indeed, the effects indicated in the first interrogatory do not and rarely, if ever, should enter into consideration in determining the question as to what is a reasonable schedule of rates of freight.

I maintain that the safe and legitimate way is to charge for the transportation of freight what the several commodities can be reasonably made to pay. A reasonable rate broadly stated is one for the establishment of which a good and justifiable reason can be given. Abstractly viewed it may not cost much, if any, more per ton to carry certain valuable kinds of freight 1 mile than to render a like service for a coarser description of freight, but if little or no difference in rates were to be made the necessary result would be the establishment of a schedule that would be prohibitory as to the coarser articles. While I am not prepared without further investigation to state positively, my belief is that the rate at which the bulk of the surplus products of the United States, such as grain, cotton, lumber, iron, ore, &c., are carried is below the average cost per ton per mile, while on the other hand the rate charged for dry goods, cloths, silks, and other articles usually rated first class, is certainly above the average cost per ton per mile, and the distribution of the charges for transportation in that way promotes and makes possible the vast commerce of the country.

In brief, common carriers in any given section are, in my opinion, justified in establishing such rates for the transportation of freight as will foster local industries and facilitate and make possible an exchange of commodities between communities, and such basis of charges must usually be arrived at in one section without regard to the conditions that govern in another portion of the same country. In other words, the rates prevailing in one section do not necessarily or commonly sustain a fixed or arbitrary relation to the charges that should obtain in another. Each schedule should be determined by its own surroundings. As already stated, averages based on past transactions are not a safe criterion to arrive at future deductions, because there is no assurance that the factors so used will accord with the subsequent results. Furthermore, average or percentage rules are predicated on fixed presumed and uniform conditions that in reality do not exist. It is fine in theory, for example, to say that one class in a tariff shall be taken as the standard, and all other classes or commodities shall be made so much higher or lower as the case may be. That may be scientific, but it is hardly practicable. The tonnage carried is not distributed in such proportions among the various classes; hence the relations assumed do not in actual operations fitly apply. The fact is that the uncontrollable forces of competition determine the schedules of railroad companies and prevent the continued exaction of unreasonable or excessive rates. Such competition is sharpest between the carriers by rail, and between the latter and the carriers by water. Railroad companies, like individuals, are jealous and distrustful one of another, and those feelings are known to shippers and advantage thereof is taken. As a rule, therefore, schedules of rates are established with a due regard to all the considerations I have enumerated, and no mathematical formula for their determination can with any degree of justice, either to the community served or to the carriers employed, be formulated.

Mr. Midgley undoubtedly states the exact situation with regard to railroad charges. They have never been established on a scientific basis or on any kind of a basis with due regard to volume of business, and perhaps never can be. They are an outgrowth of

long years of experience in handling each particular kind of freight, and making it pay as much as the traffic will bear except as affected by competition from other carriers. One can easily imagine the havoc a railroad manager would make among his patrons if he were to discard existing classifications and rate schedules, and proceed to make up an ideal freight sheet with raw products as units and finished or more valuable products paying exactly proportioned higher rates according to value and mileage, or else take as a unit the ton mile charge on his principal items of freight and base other charges on an estimated tonnage from the several classes of merchandise. Either the railroad or the communities dependent on it would be ruined, and perhaps both. Railroad freight rates are arranged to secure a large or small profit, according to special circumstances fixed by experience. Even the volume of business transacted may not influence the rate of profit. If a railroad company should have a "good thing" they are apt to hold on to it as long as possible. Customers may "kick," but their kicks are unheeded until competition shows its head.

Mr. Midgley's line of reasoning would give the Western merchants no immediate relief from the conditions of which they are complaining. They would have to wait until competition develops for such business as they may have to offer. It remains to be seen whether the court will sustain his views that "rates prevailing in one section do not necessarily or commonly sustain a fixed or arbitrary relation to the charges that should obtain in another." On this point there is room for a wide difference of opinion. Not only is the popular reasoning entirely on the other side, but it is backed up by legislative action in many States and by rulings of State railroad commissions. The interference with railroad operations from such sources was apparently overlooked by Mr. Midgley when he stated that "the uncontrollable forces of competition determine the schedules of railroad companies." There are exceptions to this rule.

There were only four branches of the iron trade, so far as statistics reveal them, which showed an increase during the year 1893 over 1892. Conspicuous among them is the production of open hearth steel, for which the figures stand as follows:

Production of Open Hearth Steel Ingots.

	1891. Gross tons.	1892. Gross tons.	1893. Gross tons.
New England, New York and New Jersey.....	32,816	33,131	42,350
Pennsylvania.....	472,607	551,010	656,516
Ohio.....		60,884	50,385
Western, Pacific and Southern.....	74,330	19,914	28,639
Totals	579,753	669,889	737,890

If it be true, as we have heard it asserted by eminent authority, that open hearth steel can be made nearly as

cheaply as soft Bessemer, then there is little to surprise us in this remarkable development in the face of bad times. Although the totals look small, the quantity of steel rails for street and electric roads produced during 1893 was 133,423 tons, as compared with 111,580 tons in 1892. We do not believe that this includes the sales by the standard rail mills to suburban and electric roads.

A third branch which has shown expansion of production is the tin plate trade.

Finally, it is a matter of record that the manufacture of wire nails expanded further in 1893. It reached 5,041,945 kegs in that year, as compared with 4,719,524 kegs in 1892 and 4,114,385 kegs in 1891. Pennsylvania gained, but Ohio fell back. In reality the progress of the wire nail has been at the expense of the cut nail, which dropped from 5,002,176 kegs in 1891 to 4,507,819 kegs in 1892 and finally to 3,048,933 kegs in 1893. The Wheeling district, which reached its maximum of 2,137,845 kegs in 1888, had fallen to 1,180,213 kegs in 1892 and finally to 691,994 kegs in 1893. Unfortunately, figures are not available to prove how the Wheeling district swung over to other specialties and succeeded in carrying through this difficult movement without the disaster which befell some of the Eastern works. It is an achievement of which the manufacturers of the district may well be proud.

"Socialism Triumphant."

The British Trades Union Congress, in session last week at Norwich, England, put itself on record as a Socialist body. By a vote of 219 to 61 the delegates adopted a resolution presented by Keir Hardie, a Socialist Member of Parliament, to "nationalize all mineral lands, as well as the whole means of production, distribution and exchange of the output of mines." Earlier in the session John Burns, another Socialist M. P., and probably the most prominent and influential exponent of the modern school of "labor" ethics, declared that the most striking result of the congress would be "to show that the old unionism no longer exists, but that Socialism is triumphant. The rapid extension of machinery and the urgency of the problem involving the unemployed workers, induces," said he, "the most hide bound individualist to adopt any method to deliver the workingman from the shackles that bind him. *Both capital and machinery, instead of making slaves of the workingman, must become his servants.* The members of the congress, of all shades of opinion, now desire to co-operate to this end." As coming from a man of the caliber of Burns, who has hitherto been regarded as one of the most honest and level headed among the British labor leaders, the foregoing declaration is significant. The adoption of a bold Socialism as the cardinal doctrine of British organized labor, if it proves anything proves that

the lessons conveyed in the French Revolution and its aftermath of Napoleonic despotism have been forgotten. It is refreshing to know that "a few moderate delegates" had the courage to protest against the Socialist contention, declaring that "trades unionism had done more for the workingmen than all the Socialist doctrines that had ever been propounded"—which is the fact.

Pittsburgh's Pre-eminence.

The most conspicuous feature in the American iron trade during the past few years has been the general acceptance on the part of the large mills of the principle that it is good policy to secure enough orders to keep running full. We do not propose to discuss the wisdom of an unflinching adherence to that policy, although we do believe that it is being carried too far. We merely desire to point out by figures to what results, from the standpoint of tonnage, it has led, so far as the Pittsburgh district is concerned. A number of the leading makers of that district have been the apostles of that policy. The figures of production just published by James M. Swank show that they have been eminently successful in that respect. What the balance sheets would prove, were they accessible, is possibly another matter.

Of the total amount of coke and anthracite pig iron made—charcoal iron being excluded as referring to different branches of trade—the Pittsburgh district produced in 1892, 19.38 per cent. In 1893, while the make of the country fell off heavily, Pittsburgh practically held its own, since it dropped only from 1,775,257 tons in 1892 to 1,697,207 tons in 1893. For the whole country the decline was from 8,619,379 gross tons to 6,737,713 tons. In that manner the percentage of the total which Pittsburgh claims was 25.19 per cent. in 1893 as compared with 19.38 per cent. in 1892.

Its pre-eminence in the Bessemer pig iron manufacture is, however, more pronounced yet, although the district is quite a heavy purchaser from other sections. In 1892 there were produced in the United States 4,444,041 gross tons of Bessemer pig, out of which 1,370,955 tons was made in Allegheny County. In 1893 the make of the country dropped to 3,560,598 tons, or over 850,000 tons, while Pittsburgh dropped only from 1,370,955 tons to 1,324,101 tons, thus practically remaining stationary. The result is that its per cent. of the total rose from 30.85 per cent. in 1892 to 37.14 per cent. in 1893.

Even higher figures are reached when the data relating to steel are examined. In 1892 there were made in the United States, 4,838,324 gross tons of Bessemer and open hearth steel ingots. To this total Allegheny County contributed 1,550,252 tons, or 32.04 per cent. In 1893 the product of the country dropped to 3,953,576 tons, but Pittsburgh nearly held its record with

1,547,484 tons, thus advancing its percentage to 39.14 per cent.

In the many forms of rolled iron and steel, excluding rails, Pittsburgh has not risen to the high position, in tonnage, occupied by it in the cruder forms. From 1892, when the district made 1,098,205 gross tons out of a total of 4,613,970 gross tons for the whole country, it rose to 1,015,134 tons out of 3,839,227 tons in 1893. This advanced its percentage from 23.80 per cent. to 26.44 per cent.

Including rails, which were taken out of the figures just quoted, the Pittsburgh district was credited in 1892 with 1,437,096 tons out of a total of 6,165,814 tons of all rolled iron and steel. In 1893 Allegheny County declined to 1,249,564 tons out of a total of 4,975,685 tons. This is a change from 23.3 per cent. in 1892 to 25.1 per cent. last year.

The figures quoted certainly show the ability of the district to hold its trade at low prices and make up for what losses in volume of business are undergone in its own territory by capturing a share of the work coming up elsewhere. We do not believe that Pittsburgh stands alone in this respect. The figures in detail are not, unfortunately, available, but it is perfectly well understood that the Mahoning and Shenango valleys and the Cleveland district fully possess the ability to stay with their large rival so far as cost of production and of placing of cheap steel upon the markets of the country is concerned. We have no data bearing on the Wheeling district, which on the whole has not shown itself to be so aggressive.

The Western Cast Iron Pipe Trade.

A notable revival of business has taken place in the Western cast iron pipe trade. It appears to have begun in July, gathered force in August and is now swinging along with something of its old time vigor. The foundries of the West and South, which supply this trade, have filled up with orders until quite a number of the principal establishments are unable to promise deliveries within 90 days. As a natural consequence of this activity prices have stiffened, and an advance of at least \$2 per ton has been made on the rates ruling early in the summer. Purchasers of pipe who were unwilling or unable to supply themselves while extremely low prices were prevailing have lost their opportunity.

The demand arises from two causes, according to authorities in the trade. One of these is the enforced economy of last year, when water works and gas works were obliged to desist from making extensions and improvements on account of the scarcity of funds and the husbanding of resources through fear of more serious financial disturbances which were apprehended by all classes of business men. This resulted in throwing a large amount of work into this year, which is being readily undertaken, with the easy

money market and returning confidence in the re-establishment of national prosperity. Municipalities and corporations are again making extensions to conform to the increasing wants of their patrons for both water and gas.

The other cause is the revival of activity in the establishment of new water and gas plants in small towns which have grown to sufficient strength to support them. This movement is influenced in a great measure by the very low cost of materials and labor. As compared with costs two or three years since, a great saving can now be effected in the initial expenditure.

Another consideration with some municipalities is the employment of citizens who are idle and lack the means of subsistence. The entire community thus contributes to their relief without making them objects of charity while securing the benefit of permanent improvements which have perhaps long been needed. Work of this character can be undertaken easily at present, owing to the abundance of money and the desire of capitalists to seek safe investments. This is in fact such a feature of the existing situation that the members of the pipe trade are looking forward to a still heavier business next year, when projects for many new enterprises of this character will be consummated which are now going through the preliminary stages.

The importance of the cast iron pipe trade is shown by the census statistics of 1890. In the census year the total quantity of pig iron consumed in the pipe foundries was 527,909 gross tons. The condition of this trade is, therefore, no small factor in determining the course of foundry pig iron. Heavy purchases by pipe foundries have frequently imparted stability to an otherwise weak market. Manufacturers of foundry pig iron have therefore good reason to regard the improvement in the pipe trade with deep interest.

A good many extravagant stories concerning the Chinese iron and steel plant have been printed by ignorant newspaper correspondents. Some plain figures may be taken from an article by G. J. Snelus in the *Engineering Review*, which will convey an accurate idea of the magnitude of the works. They are situated on the Yangtse Kiang River at Hankow. There are two furnaces 65 feet high, with 55-foot Cowper stoves. There are also four calcining kilns. There is a Bessemer plant with two converters and an open hearth plant with four furnaces. A rail mill extends beyond the Bessemer works, and a plate and a bar mill beyond the open hearth furnaces. A bolt and nut manufacturing shop and a small arms factory are completed. A gun and armor plant is being added. The aim of the Chinese Government is to make itself independent of foreign countries for its supplies of war material.

At a meeting of the stockholders of the Chapin Mine, held at Milwaukee on the 30th ult., it was decided that the bondholders' mortgage sale should be permitted. This famous iron mine will therefore be sold at auction at an early day under foreclosure proceedings.

CORRESPONDENCE.

Free Raw Materials and the Markets of the World.

To the Editor: "Give us free raw material and we will take the markets of the world," is one of the favorite expressions and the strongest arguments the free trader has in favor of free raw material.

I see in your issue of August 9, under "Treasury Decision," a notice of a "drawback on wire." You very clearly show that the Maryland Steel Company of Sparrow Point, Md., imported iron ore and imported ferromanganese which were converted into steel billets. These were sold to the Consolidated Steel & Wire Company, were rolled into rods, drawn into wire, made into barb fence and then sold abroad. The Maryland Steel Company received a drawback of 99 per cent. of the duty on iron ore and ferromanganese, the raw material from which Bessemer steel is made. Is not this giving us free raw material to take the markets of the world? But I see that under the McKinley bill expensive material on which a large amount of labor had been expended, such as steel plates for band saws, which you also refer to, which have to be of superior quality, extra well finished and dead accurate as to dimensions, is also allowed 99 per cent. drawback on the duty, provided they were made into saws and exported. Further than all this, a certain percentage is allowed for loss in manufacture, so that the full advantage of this drawback of the duty on raw material is obtained, and to show that the McKinley bill favored the idea to such an extent that in some cases it is an injustice to the American manufacturer, we have only to cite that the Standard Oil Company buy large quantities of tin plates which are made into cans, filled with refined oil, which is exported. On all tin plate used for this purpose 99 per cent. drawback on the duty is allowed them. Calling tin plate raw material is straining the point beyond common sense. Still such was the desire on the part of the framers of the McKinley bill to enable us to reach the markets of the world that this was done.

This act was passed in 1890 and has been in force nearly four years, yet the political demagogue cries out: "Give us free raw material and we will take the markets of the world."

On September 26, 1892, nearly two years after this policy was in force, A. K. McClure of Philadelphia delivered a speech in the Philadelphia Academy of Music on "The McKinley Tariff Robbery and Fraud." He devoted a large part of the time in a plea for free raw material. He quoted Mayor Bent, the manager of the Steelton Works near Harrisburgh (and who is now one of the leading men of the Maryland Steel Company) as saying: "Give us free ore and I will sell pig iron in Liverpool and send steel rails to England." McClure stated that Charles H. Cramp, in a recent article in the *North American Review*, showed that "we can produce American ships even of better structure than the English ships, and quite as cheap, if only given an equal chance." If Mr. McClure and Mr. Cramp will only look up the McKinley bill, section 8, they will find it reads: "That all lumber, timber, hemp, manila, wire rope and iron and steel rods, bars, spikes, nails, plates, tees, angles, beams and bolts and copper composition metal which may be necessary for

the construction and equipment of vessels built in the United States for foreign account and ownership or for the purpose of being employed in the foreign trade, no duties shall be paid thereon."

Now, what more can the most ardent advocate of free raw material to obtain the markets of the world ask for? Why in the past four years has not C. H. Cramp been busily engaged in building ships, competing with the Clyde and Belfast shipbuilding? It was certainly not for the lack of free raw material. Why do not the Maryland Steel Company make pig iron and steel rails and send them to England?

I cannot help comparing all those who are sincere in the cry of free raw materials to obtain the markets of the world to a sailing vessel which, some years ago, was sailing on the Atlantic. They encountered very severe storms for many days; a heavy sea stove in their fresh water barrel. As the storm subsided they encountered a heavy fog, which enveloped them for several days more. They had lost all reckoning and were drifting helplessly, suffering intensely for the lack of water, when a small fishing smack appeared within hailing distance. When the cry from the sailing vessel for water to drink was made, the answer came back: "Dip and drink." They had drifted right into the mouth of the Mississippi and were sailing in a large body of fresh water and almost dying from thirst and yet did not know it. So likewise all advocates of free raw material to obtain the markets of the world have been drifting in the sea of opportunity and did not know it. But with the majority of our Congressmen of the present day it is: "When ignorance is bliss it is folly to be wise," and their ignorance of the practical requirements of the country is most sublime. W. G.

PERSONAL.

One of the visitors to this country last year was Eugene François, one of the principal engineers of the Société Cockerill at Seraing, Belgium. The results of his observations on American methods of building machinery have been contributed to a Belgian engineering society and have just been published in the *Revue Universelle des Mines*. He attributes American capacity to compete in neutral markets to simplicity and uniformity of construction and the use of cheaper materials, to the equipment of the shops and to the organization in the work. M. François seems to have gathered the greater part of his observations in the Baldwin, Westinghouse, Worthington and Allis works.

Abram S. Hewitt of New York has announced that he will soon sail for Europe.

C. M. French, for 20 years manager of the Pennsylvania Drop Forge Company of Pittsburgh, has severed his connection with that concern.

James P. Witherow of Pittsburgh has been spending some time on the Pacific Coast. He is reported to be planning the establishment of steel works at either Vancouver, B. C., or at some point in the State of Washington, with a view to supplying the coast rolling mills with steel billets.

Carwheels have recently sold at $\frac{1}{2}$ cent per pound, or \$4 12 $\frac{1}{2}$ for a 550-pound wheel.

OBITUARY.

JOSEPH M. LARIMER.

The iron trade of the Northwest has lost one of its ablest and most prominent members in the death of Joseph M. Larimer, which occurred at his home at Evanston, Ill., on the 24th ult. He had been ill for over two weeks, but was believed to be convalescing, when he suddenly collapsed and the skill of his physicians was of no avail. Mr. Larimer was a young man only 43 years of age, but had been for 15 years manager of the branch house of Jones & Laughlins, Limited, at Lake and Canal streets, Chicago. He was a nephew of B. F. Jones, the head of that great establishment, and entered the Chicago house in 1867, had never been in any other business, and became manager in 1879. Under his able administration the business of the house has steadily grown, notwithstanding the great development of local manufacturing establishments in competing lines. Mr. Larimer was a member of a prominent family in Western Pennsylvania. He was born at Pittsburgh in September, 1851. In 1854 his father removed to the West, resided for a time in Chicago and then pushed further westward, until he arrived in Colorado. Mr. Larimer's father was the founder of the present flourishing city of Denver, building the first house on its site. For some time there was a division of sentiment as to whether the future town should be named Larimer or Denver, after General Denver, who brought a large colony of settlers to the place. One of the principal business streets of Denver, however, perpetuates Mr. Larimer's memory. Subsequently the family moved to Leavenworth, Kan., whence Joseph M. departed in 1867, a boy of 16, to enter the Chicago iron house. Mr. Larimer's public spirit was recognized by his fellow citizens, who continuously re-elected him as a member of the School Board. He has two brothers living at Cedar Rapids, Iowa, and a third at Kansas City, with a sister at Pittsburgh, the widow of Thomas M. Jones, Mr. Larimer's predecessor as manager of the Chicago house of Jones & Laughlins. At the time of his death he was a director of the State Bank of Chicago, a director of the Chicago Athenæum, a member of the Union League and also of the Builders & Traders' Exchange. He leaves a widow and two children. A man of the purest life and sweetest disposition, he lived amid an ever increasing circle of devoted friends, and died to be mourned by all who knew him.

HORACE H. MAYHEW.

Horace H. Mayhew, one of the most prominent business men in Shelburne Falls, Mass., died Saturday morning, September 1. Mr. Mayhew had enjoyed his usual health till the preceding Tuesday, since which time he had been ailing. It was not until Friday, the 31st ult., that he was considered dangerously ill. At the time of his decease Mr. Mayhew was a director in the Lamson & Good-

now Mfg. Company, having previously been a trustee and treasurer in the company. He was also president and treasurer of the H. H. Mayhew Company, and president of the Mayhew Silk Company. In the seventies he represented the Franklin district in the Massachusetts Legislature as a Republican. He was about 70 years old.

A Process for Working Titaniferous Ores.

BY J. W. THOMAS, CATASAUQUA, PA.

The great difficulty in working ores containing titanium, on account of their infusible character, is a subject that certainly invites investigation and experiment. The immense field of these ores, representing as they do great



JOSEPH M. LARIMER.

wealth in iron, but at present of no commercial value for lack of an economical process of working them, offers abundant inducement for a reliable and practicable method of utilizing them.

The States of New York, Pennsylvania, Virginia and other districts in the United States contain vast beds of these ores. Some of the deposits contain large percentages of iron, but the various percentages of titanium found in them render them almost valueless in the manufacture of iron in blast furnaces. The lean ores having magnetic properties can be concentrated by the magnetic separator to 65 or 68 per cent. metallic iron. Most of these ores are very low in phosphorus, some fields containing but traces of this element. They are also very low in sulphur, which makes them excellent ores for the manufacture of steel. The infusible character of these ores, however, through the presence of titanium, makes it impossible to work them in blast furnaces in large quantities.

Small proportions of some of these ores have been used, but experience has shown that any considerable quantity

in the burden makes the cinder mushy, proving that the temperature in the blast furnace is too low to reduce titaniferous ores. A method of utilizing these ores must therefore be sought outside of blast furnaces.

I would suggest the following mixed process to manufacture steel from these ores: Treat a large amount of rich ore in the presence of a metallic bath in an open hearth furnace lined with material capable of withstanding great heat. An open hearth furnace, lined with dolomite or graphite brick, would prove sufficient for working these ores. I would suggest graphitic brick as a lining, as it would be more beneficial in reducing the ores.

Crush the ore fine enough to pass through a 20 mesh sieve, and have the coke, coal or charcoal of about the same fineness. The ore and carbonaceous materials are mixed together in the following proportions by weight: 100 parts of ore to 25 parts of coke. The amount of carbonaceous material to be added to the ore can be calculated from the amount of oxygen contained in the ore. To the above mixture add the following: Lime to the extent of 2 per cent. of the weight of ore; salt to the extent of 1 per cent. of the weight of ore. The lime and salt being stirred in water is added to the mixture to constitute a flux and hold the mixture together. The mass is then molded into briquettes of suitable size and allowed to dry for six or eight days.

The heats are carried out by forming a metallic bath of pig iron. After the pig reaches a pasty state, the briquettes previously warmed are added to the extent of 40 per cent. actual ore, and the process is carried out the same as in the manufacture of steel by the open hearth.

A steel, tough, capable of great hardness and useful for all commercial purposes, can be manufactured from these ores by the above process.

When scrap iron can be bought cheaply part of the pig iron can be replaced by scrap.

A meeting of the Iron Manufacturers' Association of the Mahoning and Shenango Valleys was held in Youngstown, Ohio, on Saturday afternoon, the 8th inst., in order to consider the request of the blast furnace employees for an increase in wages of 10 per cent. to take effect on Monday, September 10. After a thorough discussion was had upon the matter, it was decided that at this time the condition of the pig iron market and the prices being obtained for that product would not justify blast furnace operators in granting the request.

An erroneous report is in circulation that the rolling mill of the East Chicago Iron & Steel Company, at East Chicago, Ind., is closed on account of a strike against a reduction of 40 per cent. A slight misunderstanding as to the Amalgamated Association schedule of wages led to a short stoppage of the 8 inch train, but it was adjusted by the officers of the association, and the mill is not shut down.

A Heavy Increase in Pig Production.

The settlement of the coke strike has been the principal cause of the very large increase in the active furnace capacity which has taken place during August. In fact, in territory west of the Alleghany Mountains and north of the Ohio River, the current product is very close to the highest point reached at any time during the year 1893. The South is also running up its product. The question is naturally uppermost in the minds of the majority in the iron trade whether current consumption and the requirements in the near future will take care of the heavily increased tonnage.

On September 1 the active furnace plant, grouped according to fuel used, possessed the following weekly capacity:

Fuel.		
Anthracite.....	36	19,135
Coke.....	112	125,879
Charcoal.....	23	5,099

Totals August 1.....	171	151,113
Totals July 1.....	135	115,356

Increase or decrease..... + 36 + 35,757

The weekly product of all the furnaces on September 1 compared as follows with that of preceding periods:

	Furnaces in blast.	Capacity per week. Gross tons.
September 1, 1894.....	171	151,113
August 1.....	135	115,356
July 1.....	107	85,950
June 1.....	88	62,517
May 1.....	127	110,210
April 1.....	144	128,782
March 1.....	133	110,166
February 1.....	125	99,242
January 1.....	130	99,087
December 1, 1893.....	139	99,379
November 1.....	117	80,070
October 1.....	114	73,585
September 1.....	126	83,484
August 1.....	169	107,042
July 1.....	220	148,742
June 1.....	244	174,029
May 1.....	261	181,551
April 1.....	265	178,858
March 1.....	255	176,478
February 1.....	251	171,301
January 1.....	246	173,068
December 1, 1892.....	246	173,271
November 1.....	244	171,082

The status of the anthracite furnaces was as follows:

Anthracite Furnaces, September 1, 1894.

Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
New York.....	18	2	900	16	5,568
New Jersey.....	11	2	879	9	3,671
Spiegel.....	3	2	113	1	60
Pennsylvania:					
Lehigh Valley.....	44	11	4,920	33	12,700
Spiegel.....	1	0	0	1	60
Schuylkill Valley.....	27	5	3,151	22	10,002
U. S. Susquehanna Valley.....	14	4	2,405	10	3,182
L. S. Susquehanna Valley.....	16	3	2,300	13	1,794
Spiegel.....	1	0	0	1	525
Lebanon Valley.....	15	7	4,477	8	2,950
Totals.....	150	36	19,135	114	40,512

For a number of months past our records of active anthracite furnaces show the following:

	Furnaces in blast.	Capacity per week
September 1, 1894.....	36	19,135
August 1.....	36	17,186
July 1.....	32	13,766
June 1.....	30	12,139
May 1.....	35	17,607
April 1.....	34	17,739
March 1.....	32	16,618
February 1.....	27	13,627
January 1.....	29	13,081
December 1, 1893.....	32	16,188
November 1.....	34	16,166

October 1.....	34	15,338
September 1.....	43	20,758
August 1.....	51	23,572
July 1.....	63	29,268
June 1.....	70	33,918
May 1.....	67	33,168
April 1.....	72	34,641
March 1.....	74	34,778
February 1.....	74	33,871
January 1.....	70	32,772

No changes of consequence have taken place among the anthracite furnaces. It may be noted, however, that the product of some of those at work was considerably greater in August than it was in July, which may be due to the fact that they were able to use coke more liberally.

The position of the coke furnaces was as follows:

Coke Furnaces, September 1, 1894.

Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
New York.....	6	2	2,035	4	3,150
Pennsylvania:					
Pittsburgh District.....	25	23	37,773	2	2,849
Spiegel.....	1	1	915	0	0
Schenango Val. Juniata and Conemaugh Valley.....	16	13	12,445	3	2,082
Spiegel.....	18	6	6,520	10	6,308
Youghiogheny Valley.....	3	1	921	2	1,405
Miscellaneous.....	4	1	600	3	1,900
Maryland.....	5	0	0	5	6,000
Wheeling District.....	8	5	5,611	3	2,880
Ohio:					
Mahoning Val. Central and Northern.....	14	9	10,404	5	3,700
Hocking Val.....	11	6	6,087	5	2,859
Hanging Rock.....	12	1	730	11	2,441
Indiana.....	13	4	1,193	9	2,516
Illinois.....	2	0	0	2	412
Minnesota.....	19	8	14,995	11	10,540
Wisconsin.....	1	0	0	1	639
Wisconsin.....	5	1	1,140	4	2,938
Missouri.....	6	0	0	6	3,572
Colorado.....	3	2	1,690	1	600
The South:					
Virginia.....	23	8	4,919	14	8,705
Kentucky.....	7	2	712	5	2,100
Alabama.....	38	13	12,276	25	11,637
Tennessee.....	14	5	4,305	9	4,031
Georgia.....	2	1	618	1	600
N. Carolina.....	1	0	0	1	97
Totals.....	255	112	125,879	143	84,901

As compared with previous months the active coke furnaces make the following showing:

	Furnaces in blast.	Capacity per week.
September 1, 1894.....	112	125,879
August 1.....	79	94,707
July 1.....	53	68,878
June 1.....	40	47,104
May 1.....	75	88,580
April 1.....	92	105,011
March 1.....	83	89,794
February 1.....	80	81,970
January 1.....	80	81,997
December 1, 1893.....	72	78,241
November 1.....	57	58,820
October 1.....	52	53,061
September 1.....	54	56,976
August 1.....	84	77,907
July 1.....	122	117,072
June 1.....	140	132,079
May 1.....	146	139,788
April 1.....	145	135,488
March 1.....	145	138,579
February 1.....	140	129,396
January 1.....	138	131,731

The record of August is one of general resumption of work. During the month the following furnaces blew in. Buffalo in New York, Valentine, which is grouped among the "Miscellaneous" in Pennsylvania, one Edgar Thomson and one Isabella in the Pittsburgh district, Atlantic, Claire, Douglas, Ella, Fannie, Mabel, Sharon, Sharon Iron, Neshannock and Roney & Berger in the Schenango Valley, one Cambria, one Ashland in Kentucky, Seubenville in the Wheeling district, one Cleveland Rolling Mill, and River Furnace in

Northern Ohio, Belfont and one Weston in the Hanging Rock region, one South Chicago and Iroquois in Illinois, and Tod, Phoenix, Grace, Hannah, Hazelton, Hubbard, Mary and Thomas in the Mahoning Valley.

In the South, one Ensley, one Sloss and one Bessemer started in Alabama, and Chattanooga in Tennessee resumed. In Virginia Low Moor is temporarily out for repairs, and will probably resume in a few days.

The following charcoal furnace capacity was active on September 1.

Charcoal Furnaces, September 1, 1894.

Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
New England.....	13	2	152	11	895
New York.....	5	1	105	4	440
Pennsylvania.....	13	1	42	12	870
Maryland.....	6	0	0	6	418
Virginia.....	13	0	0	13	827
Ohio.....	9	4	248	5	382
Kentucky.....	3	0	0	3	290
Tennessee.....	9	1	100	8	991
Georgia.....	3	1	282	2	239
Alabama.....	13	3	643	10	2,795
Michigan.....	20	6	2,057	14	3,970
Missouri.....	1	1	293	0	0
Wisconsin.....	5	2	1,052	3	830
Texas.....	4	1	125	3	470
Washington.....	1	0	0	1	100
Oregon.....	1	0	0	1	200
Totals.....	119	23	5,099	96	13,368

As compared with previous months the record of active charcoal furnaces stands as follows:

	Furnaces in blast.	Capacity per week.
September 1, 1894.....	23	5,099
August 1.....	20	3,463
July 1.....	22	3,806
June 1.....	18	3,274
May 1.....	17	4,023
April 1.....	18	3,982
March 1.....	18	3,754
February 1.....	18	3,645
January 1.....	21	4,099
December 1, 1893.....	26	4,950
November 1.....	26	5,084
October 1.....	28	5,496
September 1.....	28	6,700
August 1.....	34	5,563
July 1.....	35	7,224
June 1.....	34	8,034
May 1.....	38	8,595
April 1.....	38	8,729
March 1.....	36	8,623
February 1.....	37	8,934
January 1.....	38	8,865

During August, Copake in New York, Muirkirk in Maryland and Clifton in Alabama, stopped work. Eagle and the large Hinkle in Wisconsin, Sligo in Missouri, and Bibb and Round Mountain in Alabama started. Weston in Michigan is running.

Stocks.

The position of stocks, sold and unsold, as reported to us September 1, was as follows, the same furnaces being represented as in former months:

	July 1.	August 1.	Sept. 1.
Stocks.	Tons.	Tons.	Tons.
Anthracite pig.....	128,825	123,913	116,893
Coke pig.....	231,430	223,902	197,877
Charcoal pig.....	213,730	220,033	217,554

Totals..... 573,985 567,848 532,264

It must be remembered, as we have frequently stated in connection with these reports of stocks, that they do not include the quantities held by the large steel companies East and West.

The crane just completed for the arsenal at West Troy, N. Y., by the Shaw Electric Crane Company of Muskegon, Mich., is claimed to be the largest traveling crane ever constructed. It is of 67 tons nominal capacity, but will easily lift 100 tons. It is 60 feet span and has a lift of 50 feet. It weighs about 80 tons, and six cars were required for its shipment.

Hot Blast and Furnace Irregularities.

In his paper, read before the Brussels meeting of the Iron and Steel Institute, Sir Lowthian Bell, once the champion of iron stoves, says:

At this point I should like to offer a few additional remarks upon the question of superheated air. This at the Clarence Works is obtained by means of Cowper's fire brick stoves, which perform their duty in a perfectly satisfactory manner, so far as heating the blast is concerned. I wish it, however, to be understood that it is very rarely indeed that anything under 20 units of coke has sufficed for producing a similar weight of pig iron. I go further and declare that it is exceptional—at any rate, in my own works—when anything less than 21 hundredweight covers the consumption of fuel containing 8 per cent. of ash. On one point I believe furnace managers are unanimous—viz., that the use of superheated air is attended with greater irregularity in point of quality of iron, and consequently in consumption of coke, than was the case when metal stoves were universally employed. Among this class of officers this want of uniformity in the blast temperatures is inseparable from the nature of brick stoves, and this comes in for the chief share of the blame for irregular working. My own experience, gathered from the daily performance of 26 furnaces—one half using Cleveland stone and the other half Lancashire hematite—confirms the opinions of the managers at the two places as regards the existence of the irregularity referred to. So far as my own observation goes, those opinions are occasionally founded on the difficulty of discovering any other cause with which they can connect the evil. This is a mode of reasoning which is fraught with much inconvenience, and often with much loss, because the adoption of an error under such circumstances too frequently leads to no further attempt being made to discover the true cause.

At the same time, I do not pretend to deny that when a furnace receives its blast from a freshly heated stove the temperature of the combustion must rise in some proportion or another. The question, however, is whether this happens to an appreciable, or, at all events, to a dangerous, extent.

Sir Lowthian Bell figures that the difference between the first and the last minute is only 4.20 per cent., and this is spread over a period of two hours.

He continues: Supposing for the sake of argument that a corresponding fall in the temperature of the hearth had taken place at the end of the two hours when a change of stoves is made. We have at once an influx of hotter air, producing by the carbon it burns 8556 calories in the first minute, which, it seems to me, would make good the deficiency of 345 calories imagined to have been possible. Besides admitting some slight variation, I am not aware that any one has noticed by the character of the slag that any real inconvenience has resulted from the change in the temperature of the blast.

Although it was not considered probable that any effect would be felt in the temperature of the escaping gases by the sudden alteration of the blast from its lowest to its highest point, special trials were made to determine this question.

Immediately after a charge is introduced a steady increase in the heat of

the gases goes on after the previous instantaneous cooling effect produced by their passage through the recently introduced cold minerals. Twenty observations, extending over as many minutes, of the temperatures of the blast and that of the gases were taken simultaneously at intervals of one minute, during which no fresh materials were introduced. The results are recorded below.

The blast, the stove being ready for changing, stood at 1151° F., and fell to 1123° at the end of the ninth minute. The escaping gases had a temperature at the beginning of 598° F., which rose to 642° F., being an increase of 44° F. The stove was changed during the tenth minute. In four minutes it rose to 1401° F., at which it remained as long as the observation lasted. The gases at the end of the tenth minute exhibited no abnormal rise, the increase of temperature over the ten minutes being 41° F.

A second trial under similar conditions to that just given was made. During the first and second ten minutes the rise in the temperature of the gases was the same—viz., 45° F. At the end of the tenth minute the blast stood at 1113° F. and the gases at 650° F. In a very brief space of time after changing the stove the blast rose to 1400° F., at which it continued to the end of the trial, while the gases had risen to 690° F., or 40° F.

A third trial was made, which also pointed to the fact that the admission of the hotter blast was not accompanied by any marked rise in the temperatures of the gases beyond that previous to such admission.

There is another fact upon which furnace owners as well as furnace managers are in accord—viz., a disposition of furnaces using superheated air to "hang," as it is termed. This, as we well know, is due to accumulations of the materials when in a plastic condition, causing the mass to adhere to the sides of the interior, and this occasionally increases to such an extent as to form narrow channels through which the heating and reducing gases rush with such velocity as to interfere very seriously, and for the furnace itself very dangerously, with its operations. I know of an instance in which a dome was formed right across the bosh, the summit of which was 27 feet from the hearth. When in the end the furnace had to be blown out it was found, from about the center of this vault, that a chimney-like opening proceeded, traversing the semi solid growth of the accumulated mineral matter. Its internal surface was rough, thereby further retarding the descent of the materials, all of which had to pass down this tube with a diameter varying from 7 to 8 feet, and about 32 feet in height, and ending at the top in a funnel 11 feet deep and 28 feet in diameter. I do not say that such an occurrence was quite unknown when blast of 800° to 1000° F. was in use, but I have little doubt that the difficulty has increased many hundredfold in the few years that fire brick stoves have been in use at the Clarence Works. Instead, therefore, of the very small variations of temperature due to the fluctuations of 100° C. or thereabouts in the blast being the direct cause of irregular working, it is, in my own opinion, much more likely to arise from a general and persistent increase of temperature over an extended area above the tuyeres, due to the use of superheated air, which favors the formation of such a growth as that just described.

In order to exhibit the nature of the

irregularities referred to, I have examined the workings of eight furnaces taken over a period of three months ending July 14, 1894. I have in each case taken three weeks in which the average consumption of fuel was at its highest, and a similar period when at its lowest. Placed in the order of the differences, the following numbers show the increased rate of fuel consumed between the two periods of three weeks each: 0.75, 1.11, 1.76, 1.85, 2.25, 2.48, 4.82, 5.47 hundredweight per ton of iron. It ought to be added, so far as my own observation goes, and I have heard it confirmed in other quarters, the tendency complained of seems to increase with the age of the furnace.

MANUFACTURING.

Iron and Steel.

The Ellwood Tin Plate Company, Ellwood City, Pa., manufacturers of tin andterne plate, have recently let a contract for a new tinning house, which will measure 50 x 100 feet in size and contain ten tinning stacks. In addition to this building the firm will put up an assorting room and pickling room in two separate buildings of about 30 x 40 feet in size. The firm have placed orders for two Morewood tinning sets with the Lloyd Booth Company of Youngstown, Ohio, and two Thomas & White sets with the Union Foundry & Machine Company of Pittsburgh, with which four machines it is their intention to make a start coating their product of black sheets, while they will gradually equip their tinning house to its full capacity as soon as conditions warrant this step being taken.

Last week the Youngstown Steel Company, Youngstown, Ohio, manufacturers of pig iron and washed metal, attached \$1995.74 in the hands of the Lloyd Booth Company of that city. The latter concern hold money owing the Midvale Steel Company of Philadelphia, and the Youngstown Steel Company are simply collecting the above named amount from the Midvale Steel Company.

Hamilton Furnace of Means, Kyle & Co., Hanging Rock, Ohio, will likely be put in blast before the middle of October.

The S. R. Smythe Company, engineers and contractors, Lewis Block, Pittsburgh, advise us that they have built and completed the following plants since last January: Five 35-ton special open hearth steel furnaces; three 27 foot 6 inch by 7 foot 6 inch regenerative gas heating furnaces; three three-hole patent separately and independently regulated soaking pit furnaces, and 2 improved gas producers, including all necessary accessories to complete said plants. All of above is run with nothing else but producer gas made from slack coal.

Crozer Furnace No. 2, size 14 x 70 feet, of Roanoke, Va., has for the past six months been doing most excellent work, having made an output of from 3850 to 8690 tons per month on all foundry iron. This is considered by experts very good work, being in excess of presumed capacity rated at from 1050 to 1250 tons per month. The ores used are furnished by the Crozer Iron Company's justly famous Rich Hill mines on Cripple Creek and the Upland mines located within 12 miles of Roanoke on the N. & S. W. R. R. They have recently erected a new washing plant at their Rich Hill mines, which embodies improvements which have proved very beneficial in the economical mining and washing of ore. The new plant will increase their capacity from 100 to 125 tons of ore per day.

The Ohio Falls Iron Works of New Albany, Ind., have put in a new 10-inch mill, equipped with a special furnace, so that runs of 110 feet can be made when necessary. These works have resumed operations on good contracts for car irons.

The new plant of the Akron Steam Forge Works, at Ellwood, Ind., was started up last week. It is equipped with powerful machinery and is ready to handle very heavy work.

The projected tin plate works of the Emlyn Steel & Tin Plate Company, at Summitville, Ind., have not been built. The buildings and machinery were ordered, but an obstacle was encountered in making

the financial arrangements before the buildings were erected, and the makers of the machinery sold it to other parties. The incorporation of the Madison Tin Plate Company of Chicago by some of the projectors of the Emlyn Company would seem to indicate that the latter had been abandoned.

Hinkle Furnace of the Ashland Iron & Steel Company, Ashland, Wis., blew in September 1, after a prolonged shut down.

Buffalo Furnace, at Buffalo, N. Y., has started up, having been idle about three months, on account of inability to secure coke.

The Riverside Iron Works' Steubenville Furnace in Jefferson County, Ohio, resumed operations on the 30th ult.

One of the furnaces of the Low Moor Iron Company, Low Moor, Va., has blown out for repairs, leaving both stacks cold. The furnace undergoing repairs will resume about September 15.

No. 2 stack of the Ashland furnaces, at Ashland, Ky., blew in August 27, and both furnaces are now in full operation.

Chattanooga furnace, at Chattanooga, Tenn., operated under lease by the Georgia Mining, Mfg. & Investment Company of Atlanta, Ga., went into blast August 30. Rising Fawn Furnace, also operated under lease by the same company, continues to run steadily.

Machinery.

In consequence of a large number of applications made to view the new plant of the Westinghouse Electric & Mfg. Company, under erection at Brinton, near Pittsburgh, it has been decided to keep the buildings open for public inspection during the last three days of this week in order that visitors to Pittsburgh to attend the Grand Army reunion may have an opportunity of inspecting them.

Moore Mfg. & Foundry Company of Milwaukee have purchased a No. 5 Whiting cupola for their foundry.

The Standard Mfg. Company, Holyoke, Mass., have closed a contract with the Laird & Sweeney Mfg. Company, St. Johnsbury, Vt., to build and sell the power hammers heretofore manufactured by that concern. The hammer, which has been illustrated in *The Iron Age*, will be built in sizes from 15 to 100 pounds. The Standard Mfg. Company's line includes grinding and polishing machinery, steam engines and blacksmiths' punches and shears.

The S. Freeman & Sons Mfg. Company of Racine, Wis., have placed contracts for the erection of a new boiler shop. The structure will be 105 feet wide and 250 feet long, one story high, and of brick with iron truss roof. In connection there will be an engine room 36x72, also one story. The boiler will be 80 horse-power and the engine 60 horse-power. There will be an electric traveling crane with a 50-foot span of sufficient strength to hoist and load any sized boiler on a car. A hydraulic riveting machine, already on the ground, will be placed in the shop; it has a 9-foot gap. Side tracks will be run into the new shop. The contract for furnishing the iron work has been awarded to Milwaukee Bridge & Iron Works. Pawling & Harnishfeger of Milwaukee will put in the cranes and other machinery. The structure when completed and the new machinery put in will cost about \$25,000.

The Edward P. Allis Company of Milwaukee, Wis., are now employing from 1800 to 2000 men in their several departments. Established originally for the manufacture of flour mill machinery, this establishment has greatly widened the scope of its operations and the company have achieved distinction in manufacturing rolling mill and blast furnace engines, mining machinery, air compressors, pumping engines, hoisting machinery, &c. The incorporation of the company was effected in 1889. The capital is \$1,500,000. William A. Allis is president, Edward P. Allis, Jr., is first vice president, Edwin Reynolds, the inventor of the Reynolds Corliss engine, is second vice-president and superintendent and Charles Allis is secretary and treasurer. Among the superintendents of departments is W. D. Gray, an inventor of distinction.

D. Grupe of Davenport, Iowa, has completed four large boilers for the new Sylvan Steel Works. They are each 16 feet long and 72 inches in diameter, fitted with 60 4-inch flues, and tested to 150 pounds.

The Chilled Roll Mfg. Company, Apollo, Pa., have been granted a charter of incor-

poration, with a capital stock of \$100,000. Among the incorporators are: G. G. McMurry, Wm. Boyd and Percie Preston, all of Pittsburgh.

The Fischer Foundry & Machine Company of the South Side, Pittsburgh, have received an order from the Ohio Steel Company, Youngstown, Ohio, for one combination hydraulic billet shear and other machinery.

Announcement is made that the business heretofore conducted under the title of the Bridgeport Machine Tool Works, E. P. Bullard, proprietor, has been incorporated under the name of the Bullard Machine Tool Company, E. P. Bullard, president. The company will continue the manufacture of machine tools as heretofore.

Davis & Thomas of Catasauqua, Pa., have secured the contract for 800 yokes for an underground electric railway.

The Committee on Public Works of Allegheny, Pa., awarded a number of important contracts last week. To the Westinghouse Electric & Mfg. Company was given the contract for the extension of the electric light system of that city, the contract amounting to \$34,095.33. The Babcock & Wilcox Company were awarded the contract for two 250 horse-power boilers at a cost of \$23,342.76 and the Ball Engine Company, Erie, Pa., were given the contract for five engines at a cost of \$15,000.

The Frank-Kneeland Machine Company, Pittsburgh, Pa., have been awarded the contract for furnishing all the machinery for Goldsmith & Lewenberg. It consists of four 24 x 32 inch hot tin mills, four 22 x 32 inch cold mills, four doubling shears and engines, one 22-inch sheet bar mill, with finishing chill rolls, bar shear and shear table, with driven rollers and cooling conveyor, and a roll lathe and two squaring shears. All the machinery and equipment for this mill will be the heaviest and most complete, and when erected will constitute the latest and most advanced idea in tin plate plants. All parts are arranged to admit of natural extension, which the promoters hope to be compelled to make in the near future. Besides the above and other contracts in hand current orders for chilled and sand rolls continue satisfactory.

Hardware.

The Johnsonville, N. Y., axe factory of the American Axe & Tool Company will be closed down as soon as the material on hand is used up. About 100 men will be thrown out of employment.

The new plant of Plumb, Burdick & Barnard, at Tonawanda, N. Y., will consist of five shops, two of which are nearly completed. One is 95 feet front and 310 feet deep. It has been decided to extend this 200 feet, which will give a total length of 510 feet. The second shop is 70 x 98 feet. The roof is supported by 78 steel trusses. The shops are of fire proof construction, the roofs being of steel and slate with copper gutters and flashings. The erection of the third shop will be commenced at once and the other two shops will be built next spring.

The Baer Double-Lock Wire Fence Company of Baltimore have been incorporated, with a capital stock of \$5000. The incorporators are Martin H. Baer, J. H. Lesher, Jacob W. Eshleman, John H. Hoffman and A. C. Strite.

The Nickerson Lock & Seal Company, to manufacture locks and seals in New York City, have been incorporated, with a capital of \$75,000.

For more than two months the Medina Hollow Ware Works, at Medina, Ohio, have been idle, owing to the refusal of the employees to accept a cut in wages made by the management. A few days ago the men agreed to have the matter submitted to an arbitration committee. This committee visited the office of the company and examined the books, and reported that the company had been losing money for the last year and could not afford to pay the old prices for labor. The men have accordingly returned to work on the wages proposed two months since.

Stevens & Willis, manufacturers of tacks at South Braintree, Mass., are running on full time.

The Standard Axe & Tool Works, Ridgeway, Pa., whose shops were destroyed by fire several months since, entailing a loss of about \$30,000, have started up in their old

building and are refinishing a lot of goods that were damaged by the fire. They have prepared plans and are arranging to erect a new fire proof plant.

The Walden Knife Works, Walden, N. Y., are running on full time with a full force of workmen.

The Essex Tool Mfg. Company have been incorporated. They will manufacture tools and fancy hardware in New York City. The capital of the company is \$10,000.

The New York Knife Company have started up their works at Walden, N. Y., running full force and full time.

Miscellaneous.

The annual meeting of the stockholders of the Westinghouse Air Brake Company of Pittsburgh, with works at Wilderming, Pa., was held at the latter named place last week at which the old Board of Directors and officials were re-elected, as follows: Geo. Westinghouse, president and director; Robert Pitcairn, vice-president and director; and H. H. Westinghouse, A. M. Byers, T. W. Welsh, John Caldwell and W. C. Card, directors. There were but six stockholders present besides the officers of the company. The report showed the total assets of the company to be \$8,674,928.41, and the liabilities to be the capital stock of \$5,000,000, and the surplus of \$3,126,232.73, leaving the net earnings for the year \$548,695.68. The president stated that there had been practically no increase in the number of engine and car equipments during the year, the business of the company having been mostly from the sale of supplies for repairs and maintenance. It is expected that the applying of brakes by the railway companies to meet the requirements of the act of Congress will lead to a rapid increase in the business of the company so soon as the business of the railway companies will warrant the expenditure.

The Whiting Foundry Equipment Company, Chicago, have shipped three 15-ton patent traveling cranes to the Lindell Street Railway Company of St. Louis, Mo., for use in their new car barns and power house.

Wm. A. Nichols, Girard Building, Broad and Chestnut streets, Philadelphia, is calling the attention of electrical and steam railroad companies, municipal corporations and others to the Barnes portable railroad culvert. This culvert, it is claimed, possesses many advantages over stone foundation and other structures, and is described as being just the thing for distribution at convenient points along the line of all railroads for shipment at short notice in cases of washouts or other emergencies in order to save time in moving trains. The culvert is also stated to be an excellent water break, carrying off the water to the sides of a road and thus preventing the washing away of a roadbed.

The Standard Wheel Company, manufacturers of wagon and carriage wheels, expect to start up their several factories in Indiana by October 1. Except the Terre Haute works, these plants have been idle nearly two years, having accumulated large stocks before they shut down. A decided revival of activity is now perceived in the wheel trade and the output of these factories is again needed.

The Berlin Iron Bridge Company of East Berlin, Conn., have received the contract for an annealing room building for the Naugatuck Malleable Iron Company, at Naugatuck, Conn. The building is 94 feet wide and 175 feet long, with brick walls and iron roof trusses covered with corrugated iron.

The Cleveland Dry Dock Company, Cleveland, Ohio, through their president, J. F. Pankhurst, have filed a trust deed in favor of the Guardian Trust Company, to secure 100 bonds of \$1000 each, one-half of which are payable in ten years and one-half in 15 years. The property placed in trust includes 32 lots in the company's allotment, the dry dock, pumping machinery, boilers, engines, mills, mill machinery and building belonging to the company. The bonds were issued to raise funds for the extensive improvements recently made upon the company's docks. Nearly all have been bought by the stockholders of the company.

The Canfield Mfg. Company, Canfield, Ohio, manufacturers of farm implements, went into the hands of a receiver last week on petition of one of the creditors, Geo. D. Broughton being appointed to that position.

The Iron and Metal Trades.

The effect of the general resumption of work among the Coke furnaces of the Central West is clearly shown in the statistics of *The Iron Age* for September 1. On that date the capacity active was 125,879 tons per week, against 94,707 tons on August 1. For the whole country the weekly production rose from 115,356 tons on August 1 to 151,113 tons on September 1, the highest reached since July 1, 1893.

The grave question is whether the trade can stand this rate of production without a serious effect upon prices. It is true that in August stocks were still declining, but it must be remembered that the majority of furnaces did not blow in until the end of August. Still it has been a matter of surprise to many buyers that prices for Bessemer Pig have not softened sooner. They are weaker, and we hear that \$11.25 @ \$11.40 has been done in Pittsburgh.

For local business Pittsburgh is holding up its prices on Soft Steel quite well, but what little trade has been done for Eastern delivery had to be closed at about \$16 40 to meet the prices of Central Pennsylvania mills. Chicago reports quite some inquiry and records some sales.

In Rails reports are current, that the Pueblo mill has captured a 9000-ton order for Texas delivery. An Eastern mill has taken 4000 tons for a Philadelphia street road, while a Central Pennsylvania works has carried off a contract for 3000 tons of Girder Rails for Chicago.

There is only a moderate amount of work coming up in the Finished Iron and Steel trade. Bars and Plates are dull. Some contracts of fair size have been captured for Structural work in Chicago and New York, and the former city has a little lot of elevated work coming out.

The leading producer of Pig Iron in the South reports some good sales, two weeks aggregating over 40,000 tons. Among these is a block of 12,000 tons to a local Pipe foundry, 4000 tons to a Louisville Pipe foundry, and 10,000 tons to a Cincinnati firm of merchants, with option to double the quantity. All these sales, we are told, were made at current prices.

The market for Charcoal Iron has been in a terrible condition lately. In Chicago bankrupt stock is being forced on the market, and \$13 has become an open quotation in that market.

Chicago.

(By Telegraph.)

Office of *The Iron Age*, 59 Dearborn street, }
CHICAGO, September 12, 1894. }

Pig Iron.—The outlook is still very encouraging from the standpoint of local producers. They have enjoyed another week of good business, with an excellent demand from general consumers. Few orders for round lots were entered, but negotiations are pending for considerable quantities. One company are now so well sold up as to talk confidently of advancing prices. The inquiry for Southern Iron is a little better, but sales are light. The Southern companies are doing so much better in other markets that prices are well maintained here in spite of the small volume of business originating from this locality. Holders of bankrupt stocks of Lake Superior Charcoal Iron are more persistently forcing them upon the market, and are therefore offering them at very low prices. Makers' quotations on guaranteed brands and grades are firmly held. Quotations are given as follows for cash:

Lake Superior Charcoal.....	\$13.00 @	\$15.00
Local Coke Foundry, No. 1....	10.25 @	10.50
Local Coke Foundry, No. 2....	10.00 @	10.25
Local Coke Foundry, No. 3....	9.50 @	10.00
Local Scotch.....	10.25 @	10.50
Ohio Strong Softeners No. 1....	13.00 @	13.50
Southern Silvery, No. 1.....	..... @	.....
Southern Silvery, No. 2.....	..... @	.....
Southern Coke, No. 2.....	10.75 @	11.25
Southern Coke, No. 3.....	10.50 @	10.75
Southern, No. 1 Soft.....	10.75 @	11.25
Southern, No. 2 Soft.....	10.50 @	10.75
Alabama Car Wheel.....	17.50 @	18.00
Jackson County Silvery.....	15.50 @	16.00
Other Ohio Silvery.....	14.25 @	14.50
Coke Bessemer.....	11.25 @	11.50
Coke Malleable.....	10.50 @	11.25

Bars.—The demand latterly has been disappointing. Orders for small lots are increasing, it is true, but it takes a multitude of them to make a fair volume of business. Large buyers are doing scarcely anything at present and are endeavoring to talk down the market. Manufacturers continue to quote 1.05¢ @ 1.10¢, Chicago, on mill shipments of Common Iron from Old Rail mixture and 1.15¢ @ 1.20¢ on guaranteed Iron. Soft Steel Bars from strictly Billet stock are quoted at 1.25¢ @ 1.30¢, Chicago, for mill shipment in moderate quantities, and there is a perceptible disposition on the part of consumers to discriminate against Steel Bars rolled from Scrap. Jobbers report a much better demand from their customers, and maintain prices at 1.25¢ upward for Iron and 1.35¢ upward for Soft Steel.

Structural Material.—The American Bridge Works secured the contract for the Metropolitan Power House, obtaining better terms than would otherwise be the case on account of the stringent limitation in time, and bids are being received on the down town loop of the Lake Street Elevated, which will take 1500 tons or more of material. Some railroad bridge work is also in the market. A few large buildings are now in prospect at scattered points in the West, so that the outlook is a little more favorable. Quotations for mill shipments, Chicago delivery, are as follows: Beams and Channels, 1.45¢ @ 1.50¢; Angles, 1.40¢ @ 1.45¢; Tees, 1.65¢; Universal Plates, 1.40¢ @ 1.45¢. Small lots of Beams and Channels from stock, 1.75¢ @ 1.90¢; Angles, 1.50¢ @ 1.60¢; Tees, 1.70¢ @ 1.80¢.

Plates.—Manufacturers' agents report a fair business in mill shipments, but prices show no indication of strength. The store trade is improving

and railroads are buying more freely. Some of them have taken as much within the past four weeks as during the whole of the previous part of the year. Even this, however, does not make a large trade. Mill shipments, Chicago delivery, are quoted as follows: Tank Steel, 1.40¢ @ 1.50¢; Flange Steel, 1.65¢ @ 2.10¢; Fire Box, 1.65¢ @ 5¢. Store prices are as follows: Iron or Steel Sheets, Nos. 10 to 14, 1.80¢ @ 1.90¢; Tank Steel, 1.65¢ @ 1.85¢; Flange Steel, 2¢ @ 2.15¢; Boiler Tubes, in carloads, 70 % @ 75 % off.

Sheets.—A lively demand is in progress for both Black and Galvanized Sheets. Consumers are having much difficulty in getting deliveries from mills and in numerous cases are purchasing from other mills and making claims on manufacturers in arrears. Prices are stronger, but as some manufacturers have not as yet advanced quotations are continued at 2.35¢, Chicago, for No. 27 Common Iron, 2.45¢ @ 2.50¢ for Steel and 75 and 15 % off for Galvanized Sheets. Sheet Copper is quoted at 14¢ base, in large lots, with concessions to best buyers. Jobbers quote small lots of No. 27 Common Black Sheets at 2.50¢ @ 2.60¢ and Galvanized Sheets 75 and 5 % to 75 and 10 %.

Merchant Steel.—Manufacturers are in receipt of good orders from jobbers. This business has been a little slow to develop this season, but is now making a good record. Mill shipments, Chicago delivery, are quoted as follows: Smooth Finished Machinery Steel, 1.50¢ @ 1.60¢; Smooth Finished Tire, 1.50¢ @ 1.60¢; Open Hearth Spring Steel, 1.75¢ @ 1.80¢; Bessemer Machinery, 1.40¢ @ 1.45¢; Bessemer Tire, 1.35¢ @ 1.40¢; Ordinary Tool Steel, 5½¢ @ 7¢; Specials, 10½¢ and upward.

Billets and Rods.—The local makers have received a large number of inquiries for Billets from all classes of consumers, but negotiations are proceeding somewhat slowly. The sales of the week included a 5000-ton lot for scattered delivery. Prices are unchanged at \$18 @ \$18.25 for this immediate vicinity. Wire Rods are firm at \$25 @ \$25.25, with considerable business in prospect.

Rails and Track Supplies.—Orders for small quantities of Steel Rails continue to come in steadily and the outlook is good for work for the local mill, extending at least into the early winter. An occasional inquiry is made for next year, but hardly in a way to indicate business. Quotations are continued as follows: Standard Rails, \$25 @ \$27; Steel Splice Bars, 1.25¢ @ 1.35¢; Track Bolts, with Nuts, 2.10¢ @ 2.20¢; Spikes, 1.65¢ @ 1.75¢; Links and Pins, 1.65¢ @ 1.70¢.

Old Rails and Car Wheels.—Holders of Old Iron Rails are not willing to meet buyers' views, asking \$11 @ \$11.25. No transactions are reported. Old Steel Rails can be quoted at \$7.50 for short pieces and \$10 @ \$10.50 on long lengths. Old Car Wheels are inactive, with nominal quotation \$10 @ \$10.50.

Scrap.—An improved demand is noted by dealers. Inquiries cover all kinds of material. A disposition to advance prices is noted among dealers, but this is resisted by consumers, who insist that they are utterly unable to pay higher prices. Dealers quote the following selling prices per net ton: Railroad Forge, \$9 @ \$9.25; Dealers' Forge, \$8 @ \$8.50; No. 1 Mill, \$7; Pipes and Flues, \$6; Iron Axles,

\$12 25 @ \$12 50; Steel Axles, \$12.75 @ \$13; Heavy Cast, \$7 @ \$7.50; Stove Plate, \$5 @ \$5.50; Cast Borings, \$3 50; Wrought Turnings, \$5; Axle Turnings, \$6; Fish Plates, \$10; Horseshoes, \$9; Mixed Steel, gross ton, \$5.50.

Metals.—Lake Copper is unchanged at 9.50¢ for carload lots. Casting Copper maintains its strength at 9½¢. Spelter is firm and the market now seems to stand at 3.25¢, but local demand is still much below its usual volume. Pig Lead has receded to 3¢, but there are very few sellers at this price. The outlook is reported as discouraging by the producers, who foresee still lower prices in the near future.

C. W. Harrison, 565 The Rookery, Chicago, is agent for five Southern Pipe foundries, with a combined daily capacity of 800 tons. Pipe from 3 to 60 inches in diameter can be furnished in any quantity for water works, gas works, railroad culverts, &c.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, Pa., September 11, 1894.

The Iron and Steel market is for all practical purposes in the same condition as for two or three weeks past. Prices cannot be advanced, and it seems almost equally difficult to bring about a decline. The fact that the output of Pig Iron is considerably larger than it was earlier in the year, and that prices are maintained, proves that consumption is also very much larger than it was during the first half of the year, but the balance is so even that it is a matter of more than ordinary importance to know what the next turn will be. A little more demand might give prices a slight lift, while a falling off would have the opposite effect, or the same results might be expected to follow either an increase or decrease in supply. In other words, the market is in a condition that would probably give a quick response to favorable or unfavorable developments, whichever it may happen to be. The immediate outlook is not very encouraging, however, as there are no large orders in sight, while the amount of small business offering is not enough to impart much tone to the market. Nevertheless, there is always a possibility of a new start being made somewhere, and while a good deal has to be taken on faith in times like these, there is also a fair admixture of hope, and the trade are disposed to indulge in the latter to a greater extent than usual, which perhaps may after all be a genuine premonition of something good in the near future.

Pig Iron.—Reports differ considerably, but all agree that prices are no higher, while very few admit that they are lower. The probabilities are that the volume of business has been maintained by accepting inside and medium figures to a greater extent than usual without shading inside figures, say \$10 25 for Mill Irons, \$11.50 for No. 2 Foundry. Sellers report a very good demand for all grades, and in most cases deliveries are called for almost as rapidly as the furnaces can make them. There is an intimation of an advance in freights from the South to take effect on the first of the month, and this may have some influence on the market, but for the present consumers are perfectly easy, feeling sure of being able to get all the Iron they want at rates now current. Bessemer is a shade lower, and late deliveries could be had for about

\$13 25, and from that to \$13 75 for earlier shipments. General quotations for Philadelphia and equivalent points are about as follows:

Bessemer.....	\$13.25 @	\$13.75
Standard No. 1 Foundry X.....	12.50 @	13.00
Standard No. 2 Foundry X.....	11.50 @	12.00
No. 2 Plain.....	10.75 @	11.00
No. 1 Soft.....	11.50 @	11.75
No. 2 Soft.....	10.75 @	11.00
Standard Gray Forge.....	10.50 @	10.75
Ordinary.....	10.25 @	10.50

Muck Bars.—The demand is very light and only a small business can be done at present at about \$18.75 @ \$19, f.o.b. cars sellers' mills.

Steel Billets.—The situation is similar to that during the past several weeks, buyers determined not to pay the prices asked, makers equally determined not to sell for less. The result is that consumers are working their stocks down to the lowest point possible, and although they will soon be forced to replenish, the fact that the demand for the finished product is unsatisfactory confirms the feeling that prices ought to be lower. Still there must be such a general replenishment during the next 30 days that it will be no easy matter to make much impression on sellers, unless there are signs of an important increase in the output. Prices are nominally \$19 50 @ \$19 75 for prompt, and from that to \$19 for deferred shipments.

Finished Material.—The week has not been satisfactory from a seller's point of view. New business is slow, so that about all the trade have had to keep things moving was work on old contracts and such small orders as were secured from day to day. There are no inquiries that promise much better results in the immediate future, although later on there is some prospect of a few large jobs, but at best the situation is not bright. Prices are irregular. For such small lots as buyers require from time to time quoted rates are realized, but if anything large enough to invite close competition is presented very considerable concessions would be made, but unfortunately there is very little business of that kind coming on the market at present, so that quotations given below are for small lots, as follows:

Grooved Skelp.....	1.25¢ @	1.30¢
Standard Refined Bars.....	1.20¢ @	1.25¢
Medium quality.....	1.10¢ @	1.15¢
Tank Steel.....	1.35¢ @	1.40¢
Heavy Plates.....	1.30¢ @	1.40¢
Shell.....	1.50¢ @	1.60¢
Flange.....	1.60¢ @	1.80¢
Angles.....	1.40¢ @	1.50¢
Beams and Channels.....	1.50¢ @	1.60¢

Old Material.—There is a very good demand for nearly everything we quote, although choice Steel Scrap is specially scarce. Prices are unchanged and usually quoted as follows for lots delivered in consumers' yards.

Heavy Melting Steel.....	\$10.50 @	\$11 50
Light Melting Steel.....	8.00 @	8.50
No. 1 Wrought Scrap.....	10.50 @	11.50
Machinery Cast.....	9.50 @	10.00
Wrought Turnings.....	8.00 @	8.50
Cast Borings.....	6.25 @	6.75
Old Iron Rails.....	11 50 @	12 00
Old Car Wheels.....	9.50 @	10.00

H. F. Hall, for many years connected with the late firm of Stephen Robbins & Son of Philadelphia, and more recently with the Slatington Rolling Mill, at Slatington, Pa., has been appointed as one of the managers of the New Haven Rolling Mill Company, at New Haven, Conn. Mr. Hall assumed the duties of his new position a few days ago, and will be glad to hear from his numerous friends in Pennsylvania and elsewhere.

Pittsburgh.

Office of *The Iron Age*, Hamilton Building, PITTSBURGH, September 11, 1894.

In the Iron and Steel trades the week under review has been very quiet and prices on some lines of material have shown a sharp decline. There is a fair movement in Bessemer Pig, but purchases are made to cover immediate wants only. Billets are dull in demand and weaker in price. Structural Material is in good request and prices are being sustained. Plates and Bars are in fair demand, but prices are none too strong. Wire Nails are being sold in good quantities, but prices are about as low as have yet been touched. Wire is fairly active in demand and prices are steady. Taken as a whole the situation is not as encouraging as it was several weeks ago, either in volume of business or in prices.

Pig Iron.—The market for Bessemer Pig has shown a further decline during the week, and several transactions are reported at prices equal to \$11 40, Pittsburgh. The demand comes nearly altogether from Steel plants whose converting capacity is greater than their Pig output. However, there evidently exists the belief that prices will still further decline, as purchases are made only for close delivery. There is no denying the fact that the heavy production in Pig Iron now going on in the Pittsburgh and Valley districts is alone responsible for the sharp declines in prices that have occurred. At this writing every furnace in the Pittsburgh district, with only two exceptions, is blowing, while in the Valleys nearly every stack is active. Whether prices will still further decline is, of course, uncertain, but the tendency at present is in that direction. The Valley furnace operators met in Youngstown on Saturday of last week and declined to accede to the request of the furnace employees for an advance of 10 % in wages. There is a moderate demand for Gray Forge and with the limited supply prices are sustained on the basis of \$10, Pittsburgh. Foundry Iron continues quiet in demand, but prices are being sustained. We quote as follows:

Neutral Gray Forge.....	\$9.80 @	\$10.00 Cash.
All-Ore Mill.....	9.75 @	10.00 "
No. 1 Foundry.....	11.75 @	12.00 "
No. 2 Foundry.....	10.75 @	11.00 "
Bessemer.....	11.40 @	11.50 "

We note a sale of 5000 tons of Bessemer for September delivery at \$11 40, delivered. Also a sale of 2000 tons at the same price. Also 500 tons of off Bessemer at \$10.75, delivered, and 200 tons at \$11, delivered. Also 500 tons of Gray Forge at \$9.95, delivered, equal to \$9.30 at furnace.

Ferromanganese.—We note a sale of 50 tons of 80 % domestic, equal deliveries in September and October, at \$50, delivered at buyer's mill.

Billets.—The Pittsburgh mills are sold up entirely for this month and part of next month, and as a result considerable Steel for spot delivery is being brought into Pittsburgh at prices ranging from \$17 50 to \$18, delivered, or \$17 @ \$17 25 at maker's mill. Buyers believe that Steel will be cheaper later on, and as a result are buying only for close delivery, while sellers are insisting on deliveries running into October. One Pittsburgh mill has sold their output for the balance of the year, 6100 tons per month going to identified interests and the balance is taken by another concern in exchange for Pig Iron. We note a sale of 1000 tons for September

delivery at \$17.50, Pittsburgh, and another sale of 1000 tons for September and October delivery at a price slightly less than \$17 in Wheeling district.

Muck Bars.—We note a sale of 500 tons of best grade at \$19, delivered to buyer's mill.

Bars.—A recent visit to the Mahoning Valley showed that all the mills there are in operation, some to nearly full capacity and others to about half capacity. Some large season contracts for both Iron and Steel Bars have lately been placed, and prices are reported a shade firmer. We quote Common Iron Bars at 1¢ in round lots and 1.05¢ in small lots. Steel Bars are ruling at 1.05¢ @ 1.10¢, with Bar Iron extras.

Plates.—The larger mills are securing considerable work, but in some cases it has been necessary to name a very close price where a large tonnage was involved. The demand for regular trade is steady and the outlook, as far as demand is concerned, is fairly satisfactory. We quote as follows: Tank Steel, 1.15¢ @ 1.25¢, according to order; Shell, 1.30¢ @ 1.40¢; Flange, 1.35¢ @ 1.45¢; Fire Box, 2½¢ @ 3½¢, according to quality.

Structural Material.—The demand for Beams and Channels is excellent and both local mills are being operated to full capacity. With orders now on hand and the large amount of work in sight the outlook for the future could hardly be better. Prices on Beams and Channels up to 15 inch are 1.25¢ in good sized lots and 1.30¢ @ 1.35¢ for small orders. Angles and Universal Plates are ruling at 1.15¢ @ 1.25¢, according to order, and Tees at 1.40¢ @ 1.50¢.

Merchant Steel.—Trade is very quiet and prices are showing a weaker tendency. Some makers are refusing to book season contracts at the low prices ruling, preferring to take their chances on the future. We have revised our quotations and quote as follows: Bessemer Machinery, 1.25¢ @ 1.30¢; Open Hearth Spring, 1.60¢ @ 1.70¢; Open Hearth Machinery, 1.40¢ @ 1.50¢; Machine Straightened Tire, 1.60¢ @ 1.65¢; Tool Steel, 5¢ @ 7¢ for ordinary grades; 11¢ @ 13¢ for extra grades.

Wire Rods.—There is a decided scarcity of Rods for prompt shipment, and for prompt delivery we quote at \$23.75 @ \$24 at maker's mill. An inquiry for 1000 tons for delivery this month is in the market and will likely be placed this week.

Wire Nails.—The demand continues very fair and some mills that are well fixed with orders are firm in their views as regards prices, while others are willing to name low prices when a good sized order comes along. We quote Wire Nails at \$1 @ \$1.05 in carload lots at factory. Our lower quotation has recently been slightly shaded on round lots. There is a fair trade in Cut Nails, but there is no improvement in prices. We quote at 90¢ in carload lots for usual averages.

Barb Wire.—The demand is moderate, but is considerably in excess of this time last year. We quote Four Point Galvanized at \$2 @ \$2.05 in carload lots at mill. We quote Plain Wire at \$1.25 @ \$1.30 in carload lots.

Sheets.—The demand shows considerable improvement, and the new business being placed in connection with orders booked some time ago is keeping the mills employed to about full capacity. We quote No. 24 Common

Iron at 2 15¢ and No. 27 Steel at 2 25¢. There is a heavy demand for Galvanized Iron, and some mills are considerably behind in deliveries. We quote at 75 and 15 % off in carload lots.

Pipes and Tubes.—There is nothing new to report. The demand is good, the larger concerns being employed to nearly full capacity. Prices, however, show no improvement, and continue to depend altogether on the nature of the order.

Skelp Iron and Steel.—We repeat quotations of last week, as follows: Grooved Steel Skelp, 1.05¢ @ 1.10¢; Sheared Steel Skelp, 1.15¢ @ 1.20¢; Grooved Iron Skelp, 1.25¢ @ 1.30¢; Sheared Iron Skelp, 1.35¢ @ 1.40¢, less 2 % cash in ten days.

Connellsville Coke.—There was a slight outbreak in the Connellsville region last week, and several works were closed down for a few days. Production is now up to figures prevailing before the strike, there being 18,743 ovens active in the region last week and only 8780 idle, the production reaching 138,651 tons.

St. Louis.

(By Telegraph.)

Office of The Iron Age,
Bank of Commerce Building,
St. Louis, September 12, 1894.

Pig Iron.—There is no change to note in the situation. The volume of business during the week has been fair and prices ruling are unchanged. There are no large purchases and there does not seem to be any disposition on the part of consumers to anticipate their wants and provide for the future. The low prices at present prevailing for both Ore and Coke tend to create the impression that higher prices for Iron are still a good way off, and consider present prices about as high as will be recorded this year. Consumption is gradually increasing and as there are no large accumulations of Iron on the furnace banks, it is possible that prices may improve. The present situation, however, does not warrant the statement that any improvement in this direction is likely to occur. We quote as follows for cash, f.o.b. St. Louis:

Southern Coke, No. 1 Foundry	\$11.00 @ \$11.25
Southern Coke, No. 2 Foundry	10.25 @ 10.50
Southern Coke, No. 3 Foundry	9.75 @ 10.00
Southern Car Wheel	16.50 @ 17.00
Gray Forge	9.25 @ 9.50
Ohio Softeners	14.00 @ 14.50

Bar Iron.—The general condition of trade in this department is better. Some car orders are in shape to be closed, which means increased business for the car builders. Railroads are not increasing their orders very heavily, but will shortly be compelled to do so as their stocks are in a very depleted condition. In the absence of any large business prices are well maintained, as follows: Lots from mill command 1.10¢ @ 1.15. Jobbers quote 1.30¢ @ 1.35¢, according to quantity.

Barb Wire.—The demand for Barb Wire continues to improve. There is no large business at present, but jobbers report an unusually good run of small orders which, in the aggregate, makes a fair showing. Prices are inclined to weakness, but as yet are not quotably lower. Painted, in car lots, is quoted at \$1.85; Galvanized at \$2.25.

Wire Nails.—There seems to be more or less weakness in Wire Nails,

which occasionally makes itself felt in the acceptance of orders at less than the current ruling price of \$1.20. Some mills refuse to quote less than \$1.20, while others are evidently shading this price and securing what business is going.

Rails and Track Supplies.—The demand for Light Rails shows improvement. Standard sections are in good demand at \$26.50 @ \$27; Old Iron Rails are quoted at \$10 @ \$10.50; Track Supplies are active and railroads are ordering with considerable regularity. Prices unchanged. We quote as follows: Splice Bars, 1.35¢; Spikes, 1.70¢ @ 1.75¢; Bolts, Square Nuts, 2¢; with Hexagon Nuts, 2.10¢; Steel Links and Pins, 1.55¢; Iron, 1.65¢. Standard Rails are quoted at \$26.50 @ \$27; Old Iron Rails are nominally \$10 @ \$10.50.

Pig Lead.—The market is in a condition which is hard to explain. Sellers refuse to accept less than 3 15¢ @ 3.20¢, while bids of 3.07½¢ @ 3.10¢ are the best that can be secured. Sales are light, and the situation is one of considerable uncertainty. In the absence of any heavy demand, the outlook for any advance is not very encouraging.

Spelter.—This metal is holding at 3 20¢ @ 3 25¢, with occasional sales at these figures. There are no large offerings, and there does not appear to be any disposition on the part of sellers to bear the market.

Cincinnati.

(By Telegraph.)

Office of The Iron Age, Fifth and Main Sts.,
CINCINNATI, September 12, 1894.

There has been more increase in the sales of Southern Pig Iron during the week, but the offerings were ample while not excessive, and prices are without quotable change. The Iron Pipe works were the chief buyers in this and the Southern district. There is some inquiry from Agricultural works, but they have not bought largely as yet, and the jobbing foundries have not increased their purchases to any large extent. There have been several sales of 500-ton lots, and some of 1000 tons, running through this year and three months into next year, amounting in the aggregate to upward of 10 000 tons, but prices are the same for all deliveries. There is not much demand for Charcoal Iron, but there continue to be small sales. There is scarcely any buying by Stove works. Some moderate quantities have been taken for Eastern shipment, mainly of No. 2 Foundry. Northern Iron does not cut much of a figure here, but is selling at low prices in the northern part of the State and reduces the demand here for Southern Iron somewhat. Quotations are as follows:

Foundry.

Southern Coke, No. 1	\$10.25 @ \$10.75
Southern Coke, No. 2	9.75 @ 10.00
Southern Coke, No. 3	9.10 @ 9.25
Ohio Soft Stone Coal, No. 1	14.50 @ 15.50
Ohio Soft Stone Coal, No. 2	14.00 @ 14.50
Lake Superior Coke, No. 1	12.50 @ 13.00
Lake Superior Coke, No. 2	11.50 @ 12.00
Hanging Rock Charcoal, No. 1	16.00 @ 17.00
Hanging Rock Charcoal, No. 2	15.50 @ 16.00
Tennessee Charcoal, No. 1	13.00 @ 13.50
Tennessee Charcoal, No. 2	12.00 @ 12.50

Car Wheel and Malleable Irons.

Standard Southern Car Wheel	16.25 @ 17.00
Lake Superior Car Wheel and Malleable	15.25 @ 15.75

Forge.

Gray Forge	8.75 @ 9.00
Mottled Coke	8.50 @ 8.75

Birmingham.

BIRMINGHAM, ALA., September 10, 1894.

The reports collected from this district seem to indicate a decided improvement in the general market. There is a much stronger tone, demand is more active, and general sales and collections show a decided improvement. The reports from other directions would lead one to anticipate a weakening of the market, especially on account of the weak tendency of some lines of finished material, but this has not as yet affected the local market. It is, however, delaying the resumption of the local rolling mills. The Birmingham Rolling Mill Company have signed the perpetual scale agreement with their men, but are waiting for orders from headquarters to start up. While nothing definite is known, it is very probable that no start will be made at either mill before the 15th of this month. As these mills consume in the neighborhood of 30,000 to 50,000 tons of Iron per annum, they form quite a factor in the calculations of the furnace companies. Altogether local consumption has reached close to 100,000 tons of Pig Iron per annum.

Pig Iron.—Sales and inquiries reported this week indicate a material improvement and an active demand; in fact, better than anticipated at this time. Quite a number of sales are shown in order books, ranging from 1000 to 5000 tons, and one order of over 10,000 tons has been placed at private terms. The greater run of orders, however, are for 50 to 300 and 500 ton lots. The demand for Nos. 2 and 3 Foundry for Pipe works is especially good, and Soft grades are still scarce. No. 1 Foundry is reported as scarce in one case, and showing a slight accumulation in another. One feature of the week is the strong tendency developed to buy four to six months ahead, though no sales beyond six months' delivery are reported. The furnaces are not encouraging heavy selling into next year. Collections are reported as very good. Sales are for cash with privilege of time and for three to four months' time. The time privilege is, however, not very generally taken advantage of. Sales are reported in one case as being mainly eastward; in another case the order books show three-fourths to seven-eighths of shipments to be west of Pittsburgh. Chicago sales are not numerous, yet show several 1000 ton lots at ruling rates and some small Soft lots at prices slightly higher than these. The demand there is mainly for Soft and No. 2 Foundry. Furnaces are still oversold, orders exceeding supplies, hence no especial effort is made to push any territory. Stocks are light, and where slight accumulations occur it is on lower grades to fill larger sized orders. In one case 5000 tons of No. 3 Foundry are accumulating for this purpose. The general demand is mainly for Soft and Nos. 2 and 3 Foundry, and furnaces are pressed to fill orders for immediate shipments of these grades. Demand for Gray Forge is light, but as make is the same it is held firmly at \$6.50, and furnaces are running mainly on Nos. 2 and 3 Foundry or Soft Irons to supply this demand. An offer for a large lot of Gray Forge at less than \$6.80 was refused in the last few days. There is no tendency to shade prices noticed. Freight rates will be advanced eastward by October 1, and an advance westward is also anticipated.

Financial.

While the financial situation displays no marked change from that outlined in last week's review, the business current has seemed to set somewhat more strongly in the direction of increasing activity. Slowly but steadily during the week, evidences have been accumulating of a gradual resumption of manufacture and a broadening demand for manufactured products, noticeable particularly in dry goods, but also in other branches of trade. The conviction is becoming more settled that the corner has really been turned and that all signs point to improvement. The currency is now on a sound money basis, the tariff question is taken as settled for some time; the Government's financial difficulties are straightening out; the Treasury gold balance is increasing steadily, and the condition of sterling exchange indicates the probability of resumed gold imports within a limited period. Moreover, the tale told by the latest returns of bank clearings and railroad earnings is one of reassurance. Both show gains over last year, and begin to compare more favorably with those of 1892. Still the improvement is very slow and there are adverse conditions, such as the serious losses caused by forest fires in the West and a corn crop estimated to be the lowest in 20 years, which will seriously restrict the purchasing power of the people in many parts of the country.

Speculation in stocks does not yet show any sign of a general revival. It is still narrow and professional, the outside public holding aloof from Wall street, although the market is firm and stocks are well held. Still, although the public generally is not buying, neither is it selling stocks, and this circumstance is pointed to as demonstrating that the market is shaping for a resumption of healthy activity in the near future. Dullness has generally characterized the stock market during the past week, yet as a whole prices have been well maintained, and in some cases show a gratifying advance on those of a week ago. "Sugar" and "Whisky" have performed their accustomed tumbling feats under manipulations conducted by "insiders" connected with those gambling stocks; but apart from them dealings have been exceedingly narrow. Of railroad stocks, St. Paul and Burlington have been the most active and these, with the other grangers, have scored fractional advances.

The annual report of the St. Paul road, issued on Friday, showing a balance of \$3,712,732 above fixed charges, was well received and tended to give tone to that stock both here and in London. London investors bought of it freely on Saturday. Considering that the report was for an exceptionally bad year, and yet that the road's net earnings were sufficient to cover 4% on stock and leave a comfortable surplus, the statement is taken as being highly satisfactory. The St. Paul directors are expected to declare the usual 2% dividend this week. It is also believed that Rock Island directors will declare their customary 1%. On Tuesday the declaration of the usual full dividends on both common and preferred stock of American Sugar Refineries was made, as well as 1½% on Manhattan Elevated, 1½% on "Big Four," and 1½% on Western Union. These occurrences gave a tone to the market, which closed strong, although without any appreciable increase in activity.

The bond market has shown great strength. Prices for first-class securities have advanced under steady buying by investors, while the absorption of lower grade bonds has continued in good volume. A renewed activity has set in in the demand for railroad bonds, with business well distributed and a rise in price along nearly the whole line. Reading and Richmond Terminal have both been in good request. State and municipal bonds have been active, and Government bonds remain strong. The closing prices for the latter on Wednesday were:

	Bid.	Asked.
2's, 1891, registered.....	96	.....
4's, registered.....	114	114½
4's, coupon.....	115	115½
5's, registered.....	119½	119¾
5's, coupon.....	119½	119¾

Sterling exchange, except for a small spurt at the end of last week, has been weak and declining under free offerings of grain and cotton bills. The market closed dull on Wednesday with a small demand for remittance. London buying of securities has caused talk of gold imports, but demand sterling will have to sink another 1½¢ per pound before this can be done profitably. Actual business was done on Wednesday at \$4 85 for 60 days, \$4 85½ @ \$4 86 for demand, \$4.86 for cables and \$4 84 for commercial.

Domestic exchange on New York is quoted as follows: New Orleans, commercial, 100 discount; bank, 50 discount and par; Savannah, buying par, selling ½ premium; Charleston, buying at par, selling at ½ @ ¾ premium; San Francisco, sight 12½, telegraph 15; Boston, 15 discount; Chicago, 75 discount; St. Louis, 25 premium.

Saturday's statement of the New York Associated Banks showed a gratifying expansion of loans and a stimulated movement of currency to the interior. A sharp decrease in deposits was caused by the withdrawals of funds by merchants to pay customs duties. The decrease in surplus was \$3 886,550. The banks now hold \$61,934,275 above the legal requirement, as against \$2,966,325 a year ago and \$4,781,975 two years ago. The following table shows the changes as compared with the former week:

	Sept. 1.	Sept. 8.	Differences.
Loans ..	\$48,879,900	\$49,701,400	Inc \$1,821,500
Specie....	91,187,800	90,708,900	Dec. 478,900
Legal tenders.	121,126,500	117,170,400	Dec. 3,956,100
Net Deposits	585,973,900	583,780,100	Dec. 2,193,800
Circulation....	9,784,300	9,867,700	Inc. 82,900

Money on call still loans at 1%, and time money is freely offered on good mixed collateral at about 2% for 60 days, 2½% for 90 days, 3% for 4 months, 3½% for 5 months, and 3¾% @ 4% for longer periods. The demand from the mercantile community is somewhat better. Commercial paper is in good demand, but a limited supply of first-class material prevents any great activity in this market. Rates are quoted for good double names at 3% @ 3½%; high grade single names 4% @ 4½%; 4½% and upward for others.

Bar silver has dropped during the week to 29½ pence per ounce in London and 64½¢ in New York. Shipments from New York have aggregated 820,000 ounces. Imports for the port of New York for the week ended last Saturday were valued at \$5,889 864, against \$5,679,605 for the corresponding week last year. The imports from January 1 to date were valued at \$298,726 339, against \$414,303,234 for the like period last year.

Failures for last week, according to *Dun's Review*, numbered in the United States 215 and in Canada 47, total 262, against 229 in the former week and 348 the corresponding week last year, of which 323 were in the United States and 25 in Canada. In number the failures are slightly more numerous than in the former week, owing to the fact that September settlements forced a few more suspensions, but there is not one where the amount involved exceeds \$75,000, and only 29 where the amount is over \$5000.

Metal Market.

Pig Tin.—The market is almost wholly under speculative control, but a good business has been done with consumers, and, altogether, the dealings reached a considerable total. In a speculative way nearly or quite 500 tons changed hands. Several hundred tons have been sold to consumers. For spot stock as high as 16.20¢ @ 16.25¢ was touched, and September realized 16¢, while later months went at 15.75¢, or a decline of 0.25¢ from the highest point. Along with the fact that more than 20,000 tons of Tin are in sight this discount on futures is at least suggestive, particularly as indicating that the syndicate and their allies are making the most of opportunities to sell futures while bolstering spot prices on this side of the Atlantic as much as circumstances will permit. On Wednesday the spot prices eased off to 16.15¢ @ 16.20¢; September delivery to 15.90¢, and October to 15.70¢.

Copper.—It is the general opinion that contracts closed during the past month or six weeks cover the requirements of most consumers for the balance of the year. The heavy shipments thus far indicate that the European markets also have enough American Copper to meet their wants, and the last statistics warrant the inference that Europe has quite enough of other Copper as well. The proposed agreement to restrict production on both sides of the Atlantic has not been effected, and as far as the relation of supply and demand is concerned, the market does not appear to be in better position than it was when large sales of Lake Superior Ingot were made at 9¢ 7/8 lb. Still that price is bid by some operators, and 9¢ @ 9 1/4¢ named as the lowest at which purchases can be made. Similar assumption in firmness is displayed by sellers of other varieties. Electrolytic is held at 9¢ @ 9 1/4¢ and ordinary casting stock nearly as high, but any advance on 8 1/4¢ for the latter, where actual business is involved, is strictly exceptional up to the present time. Exports from the United States during July and the seven months ending July 31 are officially reported as follows:

	July.	
	1894. Tons.	1893. Tons.
Ore—		
To United Kingdom....	none	2,952
To Germany.....	none	none
Totals.....	none	2,952
	Seven months.	
	1894. Tons.	1893. Tons.
To United Kingdom....	1,606	22,803
To Germany.....	1	28
Totals.....	1,607	22,831
	July.	
	1894. Lbs.	1893. Lbs.
Ingot, bars and old—		
To United Kingdom..	6,947,997	4,268,410
To Germany.....	1,228,563	1,512,333
To France.....	1,085,965	3,491,924
To other Europe....	7,234,404	4,119,229
To Br. No. America....	1,284	25,000
To Mexico.....	2,644	.....
Totals.....	16,500,857	13,406,896

	Seven months.	
	1894. Lbs.	1893. Lbs.
To United Kingdom....	43,330,566	8,688,962
To Germany.....	11,704,456	4,689,259
To France.....	9,176,405	10,990,234
To other Europe....	32,631,322	13,327,794
To British North America.....	155,353	304,282
To Mexico.....	133,975	65,100
To West Indies and Bermuda.....	7,481	.....
To other countries.....	1,208	33,600
Totals.....	97,146,708	37,989,281

Pig Lead.—Under the influence of rather keen competition to sell among home producers and lively foreign offering the market has gradually weakened. In fact, it has approached a stage very close to demoralization. Foreign product has been put in at as low as 3.20¢ @ 3.22 1/2¢ ex-vessel. To meet this sellers of domestic Lead dropped their figures a trifle lower and subsequently assumed the aggressive position, letting prompt shipments go at 3.15¢ and soliciting bids of 3.10¢ for October and later delivery in a manner suggesting that the negotiation was strictly with a view to business. Purchases of about 1000 to 1200 tons of foreign Lead have been closed since the new duty went into effect. Some was purchased by dealers, but the greater portion went to the combination of largest consumers. About sales of domestic Lead there has been more than usual reticence, but that a liberal business has been effected is morally certain. Probably some 3000 tons have changed hands, chiefly for future delivery.

Spelter.—From other quarters than the New York market enough orders have been placed to tone up the Western market. In fact, 3.45¢ New York delivery, is at present virtually a bargain rate for ordinary brands, and it is no easy matter to buy at under 3.50¢ for delivery further ahead than 30 days. Bids have been made of 3.47 1/2¢ for December and later deliveries. Business here has been only fair, and inquiries are of extremely commonplace character.

Antimony.—A moderate business only is passing, and prices do not vary much from about 7 1/2¢ @ 7 3/4¢ for Hallett's and 9 1/4¢ for Cookson's.

Nickel.—Prices remain on the basis of about 40¢ for ordinary lots, early or prompt delivery.

Tin Plate.—The market has been a disappointing one during the past week. Some few large consumers, who virtually buy direct, have, it is understood, placed fairly liberal orders for October and later deliveries, but can makers manifest indifferent interest, as do cannery, while jobbers act as though afraid of the extremely low prices. They can purchase full weight Bessemer Steel Coke finish Plates at or very close to \$4, and 100 lb at \$3.80 or better. Siemens Steel are relatively as low, or on the basis of \$3.90 for 100 lb. Dean grade Ternes may be had at \$3.92 1/2 @ \$3.95 for 14 x 20 and \$7.87 1/2 for 20 x 28, full weight, with discount on 100 lb or lighter weight. Other Ternes are relatively as low. Charcoals are about \$4.65 for IC, Melyn grade, one-half Cross Allaways at \$4.15 for do., full weight, and \$4 @ \$4.05 for 100 lb. Corresponding prices are made on other descriptions. Spot business has been of purely retail character, and for small lots out of store prices are about as follows: Charcoal, Melyn grade, IC, \$6; do., Melyn grade, Crosses, \$7.75; do., Allaway grade, IC, \$5.30; do., Allaway grade, Crosses, \$6.40; do., Grange grade,

IC, \$5.45; do., Grange grade, Crosses, \$6.45; do., Ternes, M. F., 14 x 20, \$7.20; M. F., 20 x 28, \$14.40; Worcester, 14 x 20, \$5.70; do., 20 x 28, \$11; Allyn grade, 14 x 20, \$5.05; do., 20 x 28, \$10 @ \$10.25; D. R. D. grade, 14 x 20, \$4.85; do., 20 x 28, \$9.70. IC Coke: Penlan grade, \$5; do., J. B. grade, 14 x 20, full weight, \$5.10; do., 100 lb, \$4.80; do., 95 lb, \$4.65; do., 90 lb, \$4.55. IC Bessemer Steel, Coke finish, 14 x 20, full weight, \$5.10; do., 100 lb, \$4.77 1/2; do., 95 lb, \$4.62 1/2; do., 90 lb, \$4.55. IC Bessemer Steel, Coke finish, sq., \$5.30. IC Siemens Steel, Coke finish, sq., \$5.35. Wasters: S. T. P. grade, 14 x 20, \$4.60; do., S. T. P. grade, 20 x 28, \$4.80; do., Abercarne grade, 14 x 20, \$9; do. Abercarne grade, 20 x 28, scarce.

New York.

Office of *The Iron Age*, 96-102 Reade street, New York, September 12, 1894.

Pig Iron.—The market continues very quiet, some sales agents reporting inquiries small and far between. We quote standard brands \$12.50 @ \$13 for No. 1; \$11 @ \$12 for No. 2, at tidewater. Southern Iron, same delivery, \$11.50 @ \$12 for No. 1; \$11 @ \$11.25 for No. 2; \$10.35 @ \$10.50 for No. 3; \$10.75 @ \$11 for No. 2 Soft, and \$11 @ \$11.25 for No. 1 Soft. Foundry No. 4 (Foundry Forge) is \$9.75 @ \$10.25. The freight from Birmingham is \$3.50.

Spiegeleisen and Ferromanganese.—The determination of the American producer to keep out foreign Ferromanganese was shown by the fact that an offer, on a lot of 300 tons, Pittsburgh delivery, of foreign at under \$50 was not accepted, the local maker taking the business. There is nothing doing in Spiegeleisen, which we quote \$20.50 @ \$21 for 20%. Foreign Ferromanganese is nominally \$49 @ \$50, tidewater.

Billets and Rods.—This market is very dull, only small amounts of special Billets being sold. We quote nominally for domestic \$19 @ \$19.25 and for Wire Rods \$26 @ \$26.50. In the West Wire Rods have sold at \$23.50.

Steel Rails.—An Eastern mill has sold 4000 tons for prompt delivery to go to the vicinity of Philadelphia. It is reported that negotiations are pending on foreign Rails for Gulf and Pacific Coast delivery. We note quite an active demand for Relays, which are quoted, according to character of Rails, \$16 @ \$19. It is understood that all but 3000 to 4000 tons of the Relays off the New York Central road have been sold. Girder Rails are fairly active.

Track Material.—We quote as follows for small lots: Spikes, 1.50¢ @ 1.70¢; Fish Plates, 1.20¢ @ 1.40¢; Track Bolts, Square Nuts, 2¢ @ 2.10¢, and Hexagon Nuts, 2.10¢ @ 2.30¢, delivered.

Manufactured Iron and Steel.—The contract for one of the power houses has been closed, a Pittsburgh mill taking the order for the material. One of the large contracts that will come up soon is that for the extension of the Metropolitan company of Twenty-third street. We note further sales aggregating about 14,000 bundles of Cotton Ties by an American mill. A local boiler works is reported to have closed for material lately at an extremely low price. We quote: Beams up to 15-inch,

1.35¢ @ 1.50¢ for round lots; Angles, 1.30¢ @ 1.35¢; Universal Mill Plates, 1.25¢ @ 1.35¢; Tees, 1.50¢ @ 1.60¢; Channels, 1.40¢ @ 1.50¢, on dock. Steel Plates are 1.30¢ @ 1.40¢ for Tank; 1.40¢ @ 1.50¢ for Shell; 1.60¢ @ 1.65¢ for Flange, and 1.75¢ @ 2¢ for Fire Box, and 2¢ @ 2.25¢ for Locomotive Fire Box, on dock; Refined Bars are 1.25¢ @ 1.9¢, on dock, and Common 1.10¢ @ 1.20¢; Soft Steel Bars are 1.15¢ @ 1.30¢; Scrap Axles are quotable at 1.35¢ @ 1.50¢, delivered; Steel Axles, 1.35¢ @ 1.50¢, and Links and Pins, 1.40¢ @ 1.60¢; Steel Hoops, 1.40¢ @ 1.50¢, delivered; Cotton Ties, 67¢ @ 75¢ $\frac{3}{4}$ 45 lb bundle, tidewater; Machinery Steel, 1.20¢ @ 1.40¢; Toe Calk, 1.70¢ @ 1.90¢, and Sleigh Shoe, 1.55¢ @ 1.75¢, delivered.

Charles S. Woodward has withdrawn from the firm of Henry M. Warren & Co., to become Eastern sales agent of M. A. Hanna & Co. of Cleveland, Ohio.

British Metal Market.

[Special Cable Dispatch to The Iron Age.]

LONDON, September 12, 1894.

Pig Tin prices advanced about £1, or to £71. 10/ for prompts and 5/ more for three months' futures. Early in the week prices were forced up by the syndicate that has been bulling the market, but realizations and lower prices for silver caused some reaction. This was offset by speculative support, but the market closes dull for lack of outside buyers and cautious purchases by consumers, due to manipulation of the market by the syndicate and followers. The market to day is slow, with prices at £71 @ £71. 2/6 for prompts and £71. 10/ @ £71. 12/6 for three months' futures.

Copper has undergone little change in price. There was some decline early in the week owing to adverse advices from the United States and lack of purchases by consumers here, but prices improved slightly later on speculative purchases, chiefly by American operators, followed by buying by importers. The market to-day is steady. Chili Bars at the close were quoted at £40. 7/6 for prompt delivery and £40. 15/ for three months' futures. Best selected English, £43.

Tin Plate market looks better. The demand is steadily improving, and there is more inquiry for both prompt and forward shipments. Makers are more inclined to book orders at current rates. Sales have been made of fair lines of oil sizes. Swansea quotations at present are about as follows:

Bessemer Cokes, 10.....	10/6 @	....
Siemens Cokes, 10.....	10/9 @	....
J. B. Steel Cokes, 10.....	10/9 @	....
Dean Lanes, 20 x 28	22/ @	23/
Charcoals, 10.....	11/6 @	12/6

Exports last month were 26,000 tons, against 25,000 tons in August, 1893. The shipments to the United States were 19,000 tons and 15,000 tons respectively. Stocks at shipping ports are now about 311,000 tons.

There has been a large inquiry for Black Plates for shipment to America.

Pig Lead is moderately active, but prices are somewhat irregular. Better than £9. 17/6 for soft Spanish has been the exception.

Spelter has sold slowly at prices on the basis of £15. 10/ @ 15 12/6 for ordinary Silesian.

Pig Iron has been inactive. Last sales of warrants were at 43/10 @ 44/ for Scotch and 33/6 @ 33/7½ for Cleveland. Exports last month 81,000 tons, against 96,000 tons in August, 1893.

Lake Superior News.

It has been possible to obtain exact figures of shipments from nearly all the iron mines in Minnesota and close approximations of the others. From the mines of the Minnesota Iron Company, on the Vermillion range the Chandler had shipped up to September 1. 412,000 tons, and the Minnesota 305,000 tons. The same company's Mesaba mines, two of which began work in August, did as follows: Canton, 195,600 tons; Norman, 22,000 tons; Auburn, 23,000 tons. Total shipments for this company to September 1, 992,500 tons. The Lake Superior Consolidated shipped to the same date about 375,000 tons, the Olive about 350,000, the Franklin about 84,000 and the Hale a moderate quantity. Exact figures are obtainable from no other mines, but the Gogebic range has shipped 1,230,000 tons, and the Marquette and Menominee ranges 1,800,000 tons.

Work started in earnest on the Biwabik Mine last week. 20,000 tons being shipped. It was hoped to have both sides of the mine ready for steam shovels this week, when 200 cars daily, or over 4000 tons, were to be loaded. If this can be done the wished for total for the season, 300,000 tons, will be nearly reached.

Shipments are being made from Ashland at a tremendous rate. Last week 87,000 tons were sent out, and Monday 21 large vessels cleared with ore. At this rate the American Steel Barge Company's shortages of 50,000 tons, made during the railroad strikes, will soon be wiped out.

The St. Clair Mine, the first of Mesaba mines in the vicinity of Evelyn and the Adams property, begins shipping ore this week. It has sold 30,000 tons for fall delivery.

Ever since the organization of the Rockefeller combination on the Mesaba there have been rumors of sharp deals in connection with its formation, in which a New Yorker who was at that time prominently identified with several Rockefeller organizations was alleged to be the prime mover. A suit was filed Saturday, in which the chief owners of McKinley Iron Company, one of the concerns taken into the pool, sue for recovery of \$620,000, alleging fraud and false representation. The complaint in the case is a voluminous document setting forth that the McKinley Mine was put into the pool by reason of statements of proper officials of the Lake Superior Consolidated Iron Mines that the latter was purchasing all its mines in stock at a par basis, on a valuation determined by the quantity of ore in sight, that no bonds were to be given in payment, that only certain companies of known value were to be included, while at that time negotiations were under way with companies in Minne-

sota, Wisconsin and Cuba, violating all these agreements. Several suits of more or less importance are also pending against the Consolidated by Leonidas Merritt.

At a conference held in Pittsburgh on Thursday, the 6th inst., between the Executive Committee of the Tinned Plate Manufacturers' Association of the United States and a Conference Committee from the Amalgamated Association of Iron and Steel Workers, a proposition was received from the manufacturers, in which a request was made for an average reduction in wages in tin house labor and in sheet mills making sheets for tinning purposes of 25 per cent. A long discussion was had, lasting six or seven hours, and this proposition was finally submitted to M. M. Garland, president of the above organization. Mr. Garland will send the proposition to the different lodges in the Amalgamated Association that are affected, and a vote will be taken as to whether to accept it or reject it. It is expected to hear from all the lodges on the matter not later than the 20th inst., after which date another conference will be held with the manufacturers as soon as it can be arranged. It is the general impression that the employees will refuse to accept the proposed reduction.

According to a Paris dispatch to the London Standard, the issue of the new shares in the reorganized Panama Canal Company is fixed for the 18th. The capital is to be \$13,000,000, of which \$1,000,000 will be handed to Colombia for prolonging the concession. Contractors and others connected with the old company have already taken up some \$8,000,000 and about \$4,000,000 are left to be subscribed for, and the share and bond holders of the old company have preference rights to subscribe. The directors include representatives of the Crédit Lyonnais, Crédit Industriel and the Société Générale. The liquidator will hand over all the machinery, plant, &c., of the old company to the liquidation fund, getting in return 50 per cent. of the profits in the new one.

In South Dakota there have been 3,361 386 acres of officially pronounced arid lands reclaimed and brought under cultivation by irrigation. The first cost of this work of reclamation is given at \$3,000,000, and the value of the irrigating system some three times as much. Before irrigating these lands were valued at \$77,000,000, while they are now said to be worth nearly \$300,000,000. These figures are given out in advance of the coming irrigation convention, which meets in Denver this month.

The United States gunboat "Machias," which has just been lengthened at the Brooklyn Navy Yard, was tested for stability on Saturday, when it was found that her metacentric height has been increased 10 inches. Her displacement has also been increased 170 tons, making her present tonnage 1220. At the "Machias" sea trial last spring she was found to be so deficient in stability that it was decided to add 14 feet to her length by putting a section in amidships. The data taken at her last test will be worked out by the board of experts.

A. S. Hay of Naylor & Co. is expected to arrive in this country to day.

HARDWARE.

Condition of Trade.

BUSINESS is improving. Manufacturers and jobbers agree in referring to an increasing demand, better feeling and excellent prospects for continued improvement. This naturally is more marked in some lines than in others, and some manufacturers speak in stronger terms than others of the increase in their business. There are, however, few lines in which an improved condition is not perceptible. There are indications also that the demand is setting in more freely in the South and Southwest than in the East and Northwest, but it is expected that things will soon take a favorable turn in these sections, and that before long there will be a general revival of business. While trade has assumed a larger volume than for some time orders are generally of moderate size, the trade evidently purchasing conservatively and without anything of a speculative feeling. It is noted also that the largest jobbing houses are still limiting their purchases for the most part to their early requirements. In regard to many lines also there is a feeling on the part of some large buyers that while existing prices are not likely to be much further shaded, there is a good prospect of their continuing on about the present basis, so that not much risk is incurred of having to pay more for the goods in the near future, and they prefer to take the chance rather than order beyond their present requirements. There are others who take a somewhat more sanguine view of the situation and refer to the possibility of a shortage in some lines when an active demand sets in. In support of this view the undoubted fact that stocks in the hands of the trade are exceptionally light is referred to.

Chicago.

(By Telegraph.)

The volume of business in Shelf Hardware appears to be about the same as was reported last week. The improved condition of trade has led to the employment of additional salesmen by some houses who now see an opportunity to regain part of their trade, which was relinquished during the extreme depression. House Furnishing Goods are more active. The demand

for staple goods is improving, but the country trade is still slow to speculate on the future. While orders are larger than they have been there is an absence of orders for carload lots. The ravages of forest fires in the Northwest are expected to result in a considerable volume of business to jobbers located nearest to the afflicted territory. The enterprising inhabitants of the devastated towns are rebuilding as rapidly as possible. The Heavy Hardware trade continues to improve and the volume of business in Iron and Steel considerably exceeds that for August. Prices are so low that a large addition must be made to the tonnage handled in order to compare favorably with past years, but profits are better in proportion to the amount of capital needed to conduct business. Collections are reported fair by some merchants and very good by others.

St. Louis.

(By Telegraph.)

The first ten days' business of September has been phenomenally large. Salesmen are sending in heavy orders and many buyers are here placing their fall orders. The Southwest promises to buy very heavily and many orders from Texas points are being held back for the usual cut in railroad rates. Retailers are gradually increasing the size of their orders, and taken altogether the situation is very encouraging. The drop in the temperature which is prevalent throughout the West has increased the demand for cold weather goods very materially. Wire Nails and Barb Wire show weakness without any increase in the demand. Revised prices of Cutlery to conform with the new tariff have been adopted. Tin Plates, Galvanized Iron and Roofing Iron are all in good demand. Collections are satisfactory.

Notes on Prices.

Wire Nails.—The improvement to which we have referred during the past few weeks continues, and the mills which are in operation are doing a good business, their orders being mainly for lots of moderate size, the aggregate of which is, however, large. The largest buyers are not placing orders in excess of their early requirements, preferring to take their chances as to the future course of the market. Prices are firmly maintained by the manufacturers on the basis of \$1 to \$1.05 for carload lots at mill. The New York price is \$1.20 on dock and \$1.25 to \$1.30 from store.

Chicago, by Telegraph.—The situation remains about as stated last week. Man-

ufacturers are doing a much better business in other sections than in this immediate vicinity. Large buyers here are holding off until they see that prices are absolutely rock rooted. Quotations continue at \$1.10 to \$1.15, Chicago, on factory lots. Jobbers report a considerably better movement, but thus far it has been almost entirely confined to small lots shipped from stock, on which they quote \$1.15 to \$1.20.

Cut Nails.—There is little change in the situation. The demand continues fair, and the price in the Eastern market is still represented by the quotation of 90 to 95 cents for carload lots on dock. The store price in New York in small lots is \$1.05 to \$1.10.

Chicago, by Telegraph.—A decided improvement is experienced by manufacturers, who have been receiving a much larger number of orders recently. Buyers, however, are not disposed to enter contracts of any size for future delivery, preferring to order in small quantities and more frequently rather than to carry large stocks. Prices are unchanged at 95 cents, Chicago, for factory lots, on 60-cent average. Jobbers quote small lots from stock at \$1.10 to \$1.15.

Barb Wire.—While the volume of business is not heavy the market is characterized by an excellent tone and the manufacturers are maintaining prices steadily. The market is still represented by the following quotations for Four-Point Galvanized, delivered at the points named: Pittsburgh, \$2 to \$2.05; Cleveland, \$2.05 to \$2.10; Cincinnati, Allentown, Chicago, or New York, \$2.20 to \$2.25.

Chicago, by Telegraph.—The demand is somewhat of a disappointment. The slight movement noted two or three weeks since has not resulted in much of a growth. It is now believed that not much heavy business will be entered until after October 1. Manufacturers are handling a fair volume of business as a result of good mail orders, but have so far done little in entering tonnage for future shipment. Prices for large lots do not seem to be affected, but small lots of Galvanized are now being shipped direct from the mills in this locality at \$2.25, while orders filled from jobbers' stocks bring \$2.35.

Imported Pocket Cutlery.—The importers and jobbers of Cutlery find that the adjustment of prices in view of the new tariff law is a matter requiring careful consideration and involving much detail. The general effect of the law was explained somewhat fully in

our last issue, and there is no doubt that somewhat lower prices on all patterns of imported Pocket Knives, and materially lower prices on some, will prevail. In view of the possibility that foreign costs may in some cases be advanced, and with the desire also to realize if practicable a larger margin of profit, importers and jobbers are not in all cases willing to mark down prices to the full extent that the reduced duties would justify. There is also some lack of uniformity in regard to quotations which are being made on similar goods. This is illustrated by a case in point: A Southern Hardware merchant desired information in regard to the effect of the passage of the tariff bill upon Pocket Cutlery. Taking as an example a Knife selling at \$3 per dozen the question was submitted to representative importing houses, and the result developed a considerable diversity of price. One concern stated that a Knife which sold for \$3 under the old rate of duty would now sell for \$2.80 or \$2.75. Other houses made a somewhat lower figure, while one representative firm put the new price at \$2.50, intimating at the same time that this figure if necessary could be slightly shaded.

Cordage.—There has been but little change in the Cordage market during the past few weeks, prices remaining at substantially the same figures as for some time. The market is still in the hands of the jobbers, who are underselling the manufacturers $\frac{1}{2}$ to $\frac{1}{4}$ cent a pound. The demand is fair but not heavy.

Imported Anvils.—In view of the reduced duty on Anvils imported from Peter Wright's, Wilkinson's and other Anvils have marked down their prices $\frac{1}{2}$ cent per pound.

Wagon Hardware.—Under date August 27, the Baker Chain & Wagon Iron Mfg. Company, Allegheny, Pa., issue a circular of quotations containing revised prices on their specialties, calling special attention to the reduction in prices of Wagon Hardware. They allude also to their facilities for manufacturing and to the finish and quality of their goods.

Wire Rope.—A revised list of all kinds of Iron and Steel Wire Rope is announced by the manufacturers under date September 1. This list is given herewith. It will be noticed that a change has been made to foot price for Galvanized Rope, which has heretofore been sold by the pound. In adopting this revised list the following manufacturers united:

John A. Roebling's Sons Company, New York.

Washburn & Moen Mfg. Company, Worcester, Mass.

Broderick & Bascom Rope Company, St. Louis, Mo.

A. L. Schen & Sons Rope Company, St. Louis, Mo.

Hazard Mfg. Company, New York.
Trenton Iron Company, Trenton, N. J.

Williamsport Wire Rope Company, Williamsport, Pa.

The new prices thus announced are, it will be observed, somewhat of a reduction from those which have prevailed. The new list is subject to a trade discount of 20 and $2\frac{1}{2}$ per cent. Terms 60 days or 2 per cent. discount for cash in ten days:

Their advertisement in regard to the matter will be found in this issue. This reduction is made in view of the lower duties under the new tariff. The revised prices are as follows:

No.	Per dozen.
1, Rat Trap.....	\$15.00
3, " ".....	7.25
4, Mouse Trap.....	4.75
5, " ".....	3.75

Standard Fiber Ware.—The Standard Fiber Ware Company, Mankato,

Iron Rope—19 Wires Per Strand.

Trade No.....	1	2	3	4	5	5½	6	7	8	9	10	10½	10¾	10⅝	10a	10⅞
Diameter.....	2¼	2	1¾	1½	1¼	1⅜	1½	1⅝	1	¾	¾	¾	9-16	¾	7-16	¾
List price, per ft..	76	60	52	41	37	31	26	21	16	12	10	7½	6½	5	4¾	4½c.

Cast Steel Rope—19 Wires Per Strand.

Trade No.....	1	2	3	4	5	5½	6	7	8	9	10	10½	10¾	10⅝	10a	10⅞
Diameter.....	2¼	2	1¾	1½	1¼	1⅜	1½	1⅝	1	¾	¾	¾	9-16	¾	7-16	¾
List price, per ft..	92	72	60	48	43	36	30	25	19	15	11½	9	8	7	6½	6c.

Iron Rope—7 Wires Per Strand.

Trade No.....	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Diameter.....	1½	1½	1¼	1¼	1	¾	¾	¾	11-16	¾	9-16	¾	7-16	¾	5-16
List price, per ft..	33	28	23	19	15	11½	9	7½	6½	5	4	3½	3	2½	2c.

Cast Steel Rope—7 Wires Per Strand.

Trade No.....	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Diameter.....	1½	1½	1¼	1¼	1	¾	¾	¾	11-16	¾	9-16	¾	7-16	¾	5-16
List price, per ft..	39	33	28	23	18	14	10	8½	7	5½	4½	4	3½	2¾	2½c.

Iron Tiller Ropes.

Diameter.....	1	¾	¾	¾	9-16	¾	7-16	¾	5-16	¼
List price, per ft..	21	17	14	11	9	7	6½	6	5	4½c.

Plow Steel Ropes—19 Wires Per Strand.

Trade No.....	1	2	3	4	5	5½	6	7	8	9	10	10½	10¾	10⅝	10a	10⅞
Diameter.....	2¼	2	1¾	1½	1¼	1⅜	1½	1⅝	1	¾	¾	¾	9-16	¾	7-16	¾
List price, per ft..	\$1.30	\$1.04	87	70	60	50	41	34	28	23	16½	12½	10½	9	8½	8c.

Plow Steel Ropes—7 Wires Per Strand.

Trade No.....	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Diameter.....	1½	1½	1¼	1¼	1	¾	¾	¾	11-16	¾	9-16	¾	7-16	¾	5-16
List price, per ft..	58	48	40	33	27	21	16	13	11	8½	7	5	4½	3¾	3c.

Galvanized Rope—7 Wires Per Strand.

Circumference.....	5½	5½	5	4¾	4¾	4¾	4¾	4	3¾	3¾	3¾	3	2¾
Price, per ft.....	26	24	22	20	18	16	14	12½	10½	9¾	8	6¾	5
Circumference.....	2½	2½	2	1¾	1¾	1¾	1¾	1	¾	¾	¾	¾	¾
Price, per ft.....	5¾	5	4¾	3½	3	2¾	2	1½	1¼	1	¾	¾	¾

Galvanized Rope—12 Wires Per Strand.

Circumference.....	5½	5½	5	4¾	4¾	4¾	4¾	4	3¾	3¾	3¾	3	2¾
Price, per ft.....	27	25	23½	22	20	17½	15	13½	11¼	10¼	8¾	8c.	

Galvanized Steel Hawesers.

Circumference..	5½	5½	5	4¾	4¾	4¾	4¾	4	3¾	3¾	3¾	3	2¾
List price, per ft.	45	47	41	36	32	29	26	23	21	19	17	14	12

Cast Steel Yacht Rigging—19 Wires Per Strand.

Circumference.....	4	3¾	3¾	3¾	3	2¾	2¾	2¾	2	1¾	1¾	1¾	1
Price, per ft.....	36	32	30	27	24½	19½	17	15	12½	10¾	9½	9½	7¾c.

Cast Steel Yacht Rigging—7 Wires Per Strand.

Circumference.....	4	3¾	3¾	3¾	3	2¾	2¾	2¾	2	1¾	1¾	1¾	1
Price, per ft.....	36	32	29	26	23	18	15¾	13½	10	8	6½	5½	4½c.

Sash Cords.

Trade No.....	26	27	27½	28	29
Iron.....	2	1¾	1¾	1	¾c.
Tinned.....	2¾	2¾	1¾	1¾	1c.
Galvanized.....	2¾	2¾	1¾	1¾	1c.
Copper.....	6	5	3½	2½	1¾c.

Note.—The list on Ropes with 12 wires per strand is half way between the price of Ropes with 19 wires and 7 wires per strand.

Chest Corner No 382.—This article was described in *The Iron Age* August 30. It is manufactured by the Ranson Hardware Company of Burlington, Vt. The Chest Corner is sold to the trade at \$1.60 per set of four pieces, subject to a discount of 25 and 10 per cent.

French Rat and Mouse Traps.—Birditt & Williams, Boston, announce reduced prices on the Marty French Traps for rats and mice, for which they are sole agents in the United States.

Minn., have recently issued a revised price-list on their line of Standard Fiber Ware goods. Many of the articles are unchanged, but reductions are made in a few, including Water Pails.

Sash Balances.—The Sensible Sash Balance illustrated in this issue is manufactured by N. R. Streeter & Co., Groton, N. Y.; New York office, W. H. Jacobus, 90 Chambers street, and is sold in sets of four Balances, packed one set in a box with screws, at a dis-

count of 60 per cent. from the following list:

No.	Will carry sash.	Length sash.	Per set.
4-7	4, 5, 6 or 7 lb.	30	\$2.40
8-11	8, 9, 10 or 11 lb.	33	2.60
12-16	12, 13, 14 or 16 lb.	46	3.1
16-19	16, 17, 18 or 19 lb.	46	3.70
20-23	20, 21, 22 or 23 lb.	46	4.70
24-28	24, 25, 26, 27 or 28 lb.	54	5.30
29-32	29, 30, 31 or 32 lb.	54	5.70
33-37	33, 34, 35, 36 or 37 lb.	54	5.90
38-42	38, 39, 40, 41 or 42 lb.	54	6.70
43-47	43, 44, 45, 46 or 47 lb.	54	7.28

Forstner Auger Bits—The Bridgeport Gun Implement Company, Bridgeport, Conn., and 313 315 Broadway, New York, issue a revised price-list on their Forstner Auger Bits. Only a few minor changes are made in the regular list of the goods, but the prices for the Auger Bits in sets have been reduced. The revised list complete is as follows, subject to a discount of 25 per cent.:

Each Brace Bit.....	Sizes..... 3-8	7.16	4-8	9-16	5-8	11-16	6-8	13-16
		\$.45	.55	.65	.65	.80	.80	.90
Each Brace Bit.....	Sizes..... 7-8	7.8	15-16	8-8	9-8	17-16	10-8	11-8
		\$.90	1.00	1.00	1.05	1.05	1.15	1.25
Each Machine Bit.....	Sizes..... 3-8	7.16	4-8	9-16	5-8	11-16	6-8	13-16
		\$.65	.75	.85	.85	1.00	1.00	1.10
Each Machine Bit.....	Sizes..... 7-8	7.8	15-16	8-8	9-8	17-16	10-8	11-16
		\$1.10	1.20	1.20	1.25	1.25	1.35	1.4

Special Sizes.		13-16	15-16	11-2	15-8	13-4	17-8	2
Each Brace Bit.....	Sizes..... 1-4, with spiral shank.	5-16, with spiral shank.	1.15	1.25	5.00	7.00	7.00	9.00
" Machine Bit..			.75	.60	1.35	1.45	5.00	7.00
							7.00	9.00

In Sets.

Set of 6 Brace Bits, 3-8, 4-8, 5-8, 6-8, 7-8, 8-8.....	\$4.00
Set of 6 Machine Bits, 3-8, same as above.....	5.00
Set of 9 Brace Bits, 3-8 to 11-8, in eighths, in neat case.....	7.00
Set of 9 Machine Bits, 3-8 to 11-8, in eighths, in neat case.....	8.50
Set of 11 Brace Bits, 3-8 to 8-8, in sixteenths, in neat case.....	7.50
Set of 11 Machine Bits, 3-8 to 8-8, in sixteenths, in neat case.....	9.50
Set of 17 Brace Bits, 1-4 to 11-8, in sixteenths, in neat case.....	12.50
Set of 17 Machine Bits, 1-4 to 11-8, in sixteenths, in neat case.....	15.50

Glass.—The Glass scale for the ensuing fire has been settled upon the basis of a reduction in wages of 22½ per cent., as stated in our review of the Glass market last week. It is reported that since September 1 280 pots, or their equivalent, have been put in operation. A paper devoted to the Glass interests states that the average difference in cost of imported Glass laid down in New York is about 16 per cent. for single and 17 per cent. for double strength under the new tariff schedule, and that labor has therefore shouldered its full share of the reduction in tariff. The demand for Glass is fair, but does not show any increase over that of the previous two or three weeks. Business in Plate Glass continues good, the factories that are in operation turning out the usual amount of Glass. American Window Glass is quoted at 85 and 5 per cent. discount for single and 85 and 10 per cent. for double strength Glass. Imported Window Glass still remains at 80 and 10 per cent. discount.

Net Prices.

THE WELLS & NELLEGAR COMPANY of Chicago are enthusiastic advocates of the net price system on Hardware. They have put it in practice for some time in making quotations and billing goods to customers, and say that their experience has been very satisfactory. With few exceptions their customers are strongly in favor of net prices, as they are saved much trouble in figuring over bills to ascertain the exact cost of each item, which they must know, as they sell at net prices. The exceptions noted are merchants who desire to make comparisons with prices quoted by other jobbers on the usual basis of list and discount. But even they are in favor

feasible, in running around town for orders, errands, &c., saving both time and fares.

Export Notes.

IT HAS BEEN STATED by a mill representative from which Bicycle materials are drawn that one of the large concerns making Bicycles in an Ohio city has recently shipped something like 500 Cycles to France as the result of a trip in Europe by one of the company's officials. One reason assigned for this export trade was that lighter wheels were desired, and the American manufacturers had, on the whole, made greater progress in this direction.

Roland R. Dennis, manager of the London house of Whitman & Barnes Mfg. Company, arrived in New York September 1 by the "Lucania," and will be in this country about a month.

The F. P. J. Tommings Company, 11 Murray street, New York, have succeeded F. P. J. Tommings, who died last spring. They will continue in the same line, representing manufacturers as agents for the export trade. Among the lines of goods handled are Shears, Scissors, Table Cutlery, Fire Arms, Silver Plated Ware, Stationers' Hardware and specialties, largely for trade in the West Indies, Central and South America. Frank J. Krug, who for years was with Mr. Tommings, is managing the business. They are desirous of negotiating with other concerns with a view to representing them.

Wm. E. Peck & Co., exporters, 64 William street, New York, are shipping a \$5000 Westinghouse plant for electric lighting, consisting of engines, dynamos, &c., to the Argentine Republic. A representative of *The Iron Age* was also shown a 26-page order (sheets 8 x 10 inches) for a well assorted bill of American Hardware and kindred lines, among which may be mentioned Padlocks, Axes, Sad Irons, Fluting Machines, Shovels, Horse Nails, Pike's Oil Stones, Spring Hinges, Braces, Chain, Cartridges, Hatchets, Grindstone Fixtures, Carriage Hardware, Handles, Sandpaper, Scales, Plows, Coffin Trimmings, Bench Screws, Rope, Cotton Twine, Hay Forks, Mouse Traps, Brushes, Lamps, Sinks, Vises, Augers, Adzes, Tea Strainers, Inkstands, Velocipedes, Baby Carriages, Furniture Pulls, Corn Shellers, Sewing Machines, Chairs, Duck, Sponges, Oil, &c., &c. These items were selected at random in glancing rapidly through it, there being other items not enumerated above. Those given are reproduced to give an idea of what an importing house in the River Plate country can advantageously handle.

Peña Brothers, exporters, formerly at 107 Chambers street, New York, are now at 90 Chambers street. The increase in their business warranted them in leasing the first loft at the latter address, giving them a space 25 x 75 feet in which to display samples, prepare goods for shipment, &c. The senior member of the firm was for many years with the Russell & Erwin Mfg. Company as export salesman, the junior being also employed in the

of having bills made out at net prices in most cases. The argument made in support of net prices by the Wells & Nellegar Company is that a great saving is effected by them in time and clerk hire, to say nothing of bill paper and postage, which amount in themselves to neat sums in the course of a year's business. They do not claim that any better price can be obtained by the jobber, but the other considerations given are regarded as really amounting to better prices because the cost of doing business is reduced. They say that surprise is often expressed when they quote net prices to a merchant and he finds on figuring the equivalent at list and discount that it is usually the same as that made by competing houses. This is not singular, of course, as new methods of quoting are always regarded with suspicion by buyers.

Bicycles in Business.

IT IS NOTICEABLE that Bicycles for business purposes are coming more and more into general use, especially in towns, villages and the smaller cities. Passing through Church street, New York, recently, one of our representatives observed a cyclist speeding along at a good pace attired in a conventional business suit, from the outside pocket of which protruded a copy of *The Iron Age*. A second glance identified the rider as the senior member of a young firm who have recently established themselves in the Latin America export trade. Subsequent inquiry developed the fact that both partners and one or two employees of the concern used the machine when

same house. They represent manufacturers for export, only among the export commission houses, soliciting no direct business abroad. Being natives of Cuba and having lived there and in Mexico many years, they should know much of what is suitable for Spanish American trade. They make a specialty of preparing goods for foreign shipment, making cases to fit the goods, lining the cases with water proof material to protect against moisture, and strap every box. As far as practicable they label packages in Spanish, so that a merchant on opening a consignment knows from the familiar label just what the package contains. In their judgment more is to be gained by expert packing, labeling and strict adherence to directions than concessions in price. We understand that a number of manufacturing concerns have built up a considerable foreign trade mainly by following this method. They are also paying considerable attention to jobbing for export, having found it a convenience to buyers who cannot always order full packages in a new market, but who prefer to buy the bulk of their goods in one place.

Successful Buying.

BY FRED MACEY.

IT IS AN OLD SAYING that "Goods well bought are half sold," and from the importance given by most business men to this department of their business, there seems to be considerable faith in the truth of it. A careful study of the science of buying must reveal the fact that while a buyer must to a very large extent be governed by conditions, there are still certain rules that seem to govern all transactions, and prominent among them may be named the following, which will find a connection with almost every purchase in one form or another:

Study your wants, and buy only such goods as will move.

Don't buy a new article unless there is a profit that will pay you to introduce it.

Keep close track of stock on hand.

Know what sells and how much is sold. Keep a record.

Do not allow smooth tongued travelers to sell you more than you want. When the goods come they are yours and you must pay the bill.

If you do not carry a certain article in stock and it is in your line, know where to buy it.

Keep your catalogues and price-lists in good order. Have them complete and easy of access.

Keep a Quotation Book and use it. Know, when you want anything, where you can buy it and at what price.

Study the cost of producing the goods purchased.

Take good trade papers and read them. Keep posted on the changes in tariff, expiration of patents, fluctuations in values.

Solicit prices; you command a large field at small cost.

Use neat stationery. It makes a good impression.

Always find time to be courteous to

the traveling salesman. It costs nothing and always pays.

Be clear and concise in the statement of your wants.

Look upon all quotations as being subject to change, if not in base price, then in discounts, length of time, freights, &c.

Consider all quotations strictly confidential. Never give one man's price to another.

Make price, quality and terms be the basis of a purchase. Friendship is good in its place but in business, justice only should rule.

Let dollars and cents be the first point considered in changing firms.

Keep posted on new firms. Their prices are generally good. Use them, don't overlook quality, credit, &c.

If you want good prices and quick service, telegraph. It costs something to be sure, but generally pays when done with discretion.

Calculate ahead. Ordering at poor prices, expensive telegrams and annoying delays will thus be avoided.

Work for quantity discounts. If you are not entitled to it unite with another or find a jobber who is and is willing to divide up.

Work discounts, freights, packages, &c., for all they are worth. Don't forget that 1 per cent. of \$100,000 is \$1000.

If your purchases are large let the fact be known. Competition for your trade will be all the sharper.

Work for an inside track for articles controlled by combinations, syndicates, &c. Use quantity, quality, treatment, time, style of packages, &c., for all they are worth.

Buy goods, prices guaranteed, then you are always on sure ground.

Contract when prices are low. To know when to contract, understand the supply and demand, condition of patents, changes in tariff and other points peculiar to each article.

Adopt an order blank. Embrace in the printing all the points desirable in regular orders; omissions will then be avoided.

Patronize home industries as much as possible. By so doing you contribute indirectly to your own business.

Be clear and concise in ordering. Mistakes are less liable to occur.

Keep a copy of all orders. Responsibility for errors can then be easily and surely located.

If you pay freight be sure to get all the benefit there is in water freights—low classification, quantity, method of packing, &c.

Be sure that goods received are as ordered in both quantity and quality.

Pay bills promptly. A firm can afford to sell at a less margin to good pay than to one who consumes part of his profits by collection expenses.

Never forget that a small and well assorted stock is better than a large stock. On the one hand the stock is clean and new, and money is turned oftener. On the other, stock deteriorates and its cost increases by interest and insurance on money invested.

By following the above rules there is no doubt that purchases can be made to good advantage.

Treatment of Clerks.

BY H. C. WISEMAN.

THERE are very few men, as proprietors or heads of departments, who have not profited by their own life experience in their management of clerks. The theory is frequently advanced and falsely sustained that the less a clerk knows of your business, *i.e.*, the knowledge that would make him valuable to other men, the longer he will be in your employ, the greater good his service will do you, the less good it will do any one else. A clerk to be valuable, to have confidence in you, confidence in himself, and a pleasing, open address toward purchasers he is brought in contact with, must know as nearly as possible all that you do concerning your immediate business. It is this for which you pay him and for which you expect value in his service.

Will you kindly look at

TWO STORES

you may have in mind, in the same line of business? The help in one shut off from all detail knowledge of affairs, except that which is volunteered to him—shut off from the cost of goods, the lines of profit on them, the intricacies of the making of them, the knowledge of how and where they are made. On the other hand the same number of men given every opportunity to know all detail of the business in its various parts, to be much more than mere paid automatons. Will you ask for the comparative results—can you not clearly see them?

WORTH TAKING AWAY.

Suppose these latter men did become valuable to some one else, would not their value have increased in a larger ratio to you than to any one else? A man who is worth taking away from you because of his knowledge of your business is certainly worth your keeping.

It has come to be almost an unwritten law to-day among good business men that for the best results from their help it should be given every aid in learning the complete detail of a business. A Hardwareman in search of a competent clerk or salesman most certainly would ignore one who was not entirely familiar with price-lists, discounts and all the matter which forms the basis of a proprietor's knowledge of the business. Wherefore has the crying need of price-books, price-lists, price-cards and the endless helps, been so thoroughly filled in the the last few years if not largely for this?

DAILY RULES.

It is our belief that a long list of set rules for the guidance of clerks is not necessary—is rather detrimental than otherwise. As part of a system a few are good; for instance, the following. Call them daily rules:

Store open each morning at seven o'clock.

Make your outdoor display as soon as open.

Dust thoroughly the entire stock.

Get all down goods on their shelves. Straighten up counters, racks, bins and floor.

Send out goods gotten ready previous day.

Examine order book for goods out to-day.

Go over your stock for any goods wanted.

There are such as these and others, all fitted to the line of business that are sufficient and that do not class as ironclad or offensive. There are general rules of every-day business life, as between employer and employee, that are tacitly understood and scarcely need mention, for the reason they have become as Blackstone to the profession.

RESPONSIBILITY FOR MISTAKES.

There can be no rule for the extent to which clerks should be held responsible for mistakes. It depends largely on whether the object be to teach a lesson or to save the amount lost, and the frequency of the offense. As a lesson it may effect what all the talk in the world would not, in which case it is better to hold him responsible for some minor offense, rather than the larger in which he feels you are charging him with a money value and is immediately antagonized.

The ordinary mistakes of business are made by employer as well as employee, and an occasional bringing them together and talking such things over is conducive of benefits mutual and lasting.

WORKING TOGETHER.

There is no treatment recognized and appreciated like broad, generous, sympathetic working together, the head with the dependents of a business, to get the very best results from the latter. They appreciate it, they want it and will work for it. In giving it there is no need of losing a whit of the dignity or uttering any of the confidences that are of right the employer's. Human nature is the same all over this large world of ours, and the man who expects to get profitable results from a clerk by uttering an oath, or who imagines himself safe in his system of driving them, has naught but enmity from those under him. Men do their best under the warming rays from the sun of good humor. Let it shine all day of your every-day connection with them, and you have them for all they can give you. Show them the galling side of their lives always and your business is going forward three paces at a time and slipping backward four.

EMPLOYER AND EMPLOYEE.

Their services are a commodity that is bought and sold. Pay them what they are worth; some other man will, and when we stop to think we will realize that in this, as in all other commercial dealings, we cannot get some-

thing for nothing. We are all only human at best. Labor is worth its hire, and the interests of employer and employee are very close and mutual interests.

A Pleasant Occasion.

ON AUGUST 31, at the warerooms of his late employers, Joseph Breck & Sons, Boston, Nathaniel P. H. Willis was given a reception by about 100 of his business associates, who presented him with a gold watch, chain and charm. Engraved inside the charm was a record of his business connection with the house. Sixty-four years ago Mr. Willis began work as a salesman in Boston, and during that period he has been in the service of one house. When Mr. Willis was about 16 years old he began to work for Joseph R. Newell of 108 State street. The business was soon after taken by Joseph Breck & Co., and with this concern Mr. Willis has remained up to a short time since. Mr. Willis traces his ancestry back to the time of George Willis, described as a "Puritan of some distinction," who landed in New England about 1630 and settled in Cambridge. Mr. Willis is also a cousin of the poet, Nathaniel Parker Willis, son of the founder of the *Youth's Companion*. Although Mr. Willis has recently resigned his position with Joseph Breck & Sons, his name is still on the payroll of the house with which he has grown old in service, and it is expected that it will stay there during the remainder of his life.

Stocks and Dies for Bicycle Repairs.

PETER A. FRASSE & CO., 95 Fulton street, New York, owing to the demand for small sets of Stocks and Dies for Bicycles and kindred goods, have brought out the 00 and 0 Flexible Back Split Die, branded F & H. The 00 set consists of one each F & H tap wrench and drop forged die holder; one tap and die each Nos. 1, 1½, 2, 3, 4, 5 screw gauge sizes, with threads per inch graduated 72, 56, 56, 48, 42 and 40 respectively. The No. 0 is similar, with a larger assortment of taps and dies, having one each Nos. 1, 1½, 5, 6, and two each Nos. 2, 3 and 4 screw gauge sizes. The No. 0 set has a range of diameters of from 1/16 to 1/8 inch; the No. 00 from 1/16 to 3/4 inch. The sets are neatly put up in wood boxes with hinged covers, and sold to the trade at \$5 per set for No. 00 and \$8 per set for No. 0, subject to a trade discount of 33½ per cent.

Correction.

IN OUR ISSUE of August 9, in referring to Paddock & Kleine's export trade, we erroneously mentioned net prices for Sarven's or Warner's Wheel for Buggies or Wagons, tired, ready for painting, as \$2.50 to \$8 per set of four, according to kind. This reference to the price, however, was incorrect, as the figures named should have been quoted for tires only. The trade will please note the correction.

HOLBROOK, MERRILL & STETSON, the well-known jobbing concern in San Francisco, Cal., have removed their New York headquarters from 218 Water street, where they have been for 25 years, to a suite of offices in the new Home Life Insurance Building, 256-257 Broadway. The business at

this end has long been and is now under the supervision of Charles Merrill, one of the partners. They have rooms 509 to 511 on the fifth floor, overlooking the North River.

Trade Items.

NIAGARA SILVER COMPANY, Niagara Falls, N. Y., manufacturers of Flat Silver Ware, formerly at 48 Murray street, in this city, have removed to 88 Chambers street. C. H. Fessenden, who heretofore has had charge of sales in this territory, will in the future supervise this department of the business in all of the region west of Buffalo, N. Y. F. F. Spyer, who will manage the New York office, will in the future look after the section east of Buffalo. W. A. Jameson is the general manager.

THE GEAUGA FOUNDRY & MFG. COMPANY, Painesville, Ohio, have long been known as manufacturers of Stoves, but they have recently added a special department to their plant in which they will make a line of standard specialties under the trade-mark or brand of "Ohio" goods. Their initial list of such goods comprises the Ohio Water Tight Steel Mortar and Brick Hods, Ohio Steel Tack and Screw Boxes, Ohio Steel Tote Shop Boxes and Ohio Knock-down Stove Pipe. These goods are made under letters patent and are offered, it is stated, at very reasonable prices. The company have engaged C. M. Avery, who is well and favorably known to the trade, to act as their direct jobbing representative in this department of their works.

THE CONNECTICUT VALLEY MFG. COMPANY of Centerbrook, Conn., whose buildings and machinery were destroyed by fire last March, have completed their new factory and expect by October 1 to resume the manufacture of their well known Wright's Jennings Bits, the Clark Expansion Bit and specialties in Hardware. The company have taken advantage of the necessity for new machinery to replace their old machines with those combining the latest and most valuable improvements. Their forging shop is a one-story building, 105 x 22 feet. The machine shop is a brick structure, two stories high, 73 x 37 feet. The plant has both steam and water power and is amply equipped for the employment of 160 men.

PATTERSON, GOTTFRIED & HUNTER, 146-150 Centre street, New York, are sending out representations of various kinds of Screws and Bolts which are unique as an advertising feature. The Screws represented are the product of the Hartford Machine Screw Company, and the cardboard upon which the printing is done is cut out, following all the irregularities of the heads and threads. A list of the kinds of Screws and Bolts made is printed on the threads, while the firm's name appears on one side of the heads and the maker's name upon the other side.

WITHINGTON & COOLEY MFG. COMPANY, Jackson, Mich., announce Floral Sets, which they are now putting up with four tools instead of three, having added their Dandelion Spud, and are furnishing the four tools at the price heretofore made for the three. The manufacturers remark that the tools are not toys, but serviceable tools of good material, well made and finished. It is stated that the Hoe and Spade have forged steel blades, brightly polished, and that the Rake is of malleable iron, of the latest pattern, polished. The Dandelion Spud is especially designed for use on lawns or grass plats.

THE GRAND RAPIDS REFRIGERATOR COMPANY of Grand Rapids, Mich.,

manufacturers of the Leonard cleanable hardwood Refrigerators, have favored us with a copy of an attractive publication entitled "Grand Rapids As It Is." The growth of this enterprising city is indicated in the fact that its population was 8085 in 1860; 32,016 in 1880, and is now 80,020. The book, which is published by the Grand Rapids Board of Trade, comprises 52 pages, finely illustrated, giving views of public buildings, office and business blocks, factories, handsome private residences, &c. It is not loaded down with details regarding business enterprises, and therefore avoids the appearance of mere advertising. A view is given of the factory of the Grand Rapids Refrigerator Company, which is shown to be an imposing structure, six stories and basement. The book does not show either of the company's large warehouses used for storage purposes, one of which is 100 x 100 feet, four stories and basement, and the other is 50 x 275 feet, one story 24 feet high in the clear. The factory, which is illustrated, is used exclusively for manufacturing purposes and has a capacity of 50,000 Refrigerators per annum. The company claim this to be the largest Refrigerator factory in the world. They announce that their new styles for 1895 are especially fine.

SCHMITZ & GOLDFINCH have recently established themselves at 107 Chambers street, New York, for the purpose of representing manufacturers of various articles for domestic trade. Among the concerns for whom they are now acting are mentioned the Leach Roaster & Baker Company, Paxton, Ill.; Nixon & Co., New York, Axe, Pick, Rake and other Wood Handles; Mishawaka Pad & Harness Company, Mishawaka, Ind., together with a line of Wrought Goods. They are also in negotiation with three or four additional concerns with whom they expect to conclude arrangements shortly. It will be a feature with them to push specialties largely. F. P. Schmitz of the firm was recently with Surpluss, Dunn & Alder as one of their traveling salesmen.

Price-Lists, Circulars, &c.

H. A. ROGERS, 19 John street, New York: Railroad Supplies, Machinists' Tools, Mining Implements and Mill Machinery. A catalogue devoted to these goods contains prices of Anvils, Barrows, Belting, Blocks, Bolts, Chucks, Drills, Files, Moncrieff's Scotch Glass Tubes, Hose, Packing, Wrought Iron Pipe, Valves, &c.

SICKELS, SWEET & LYON, 35 Barclay street, New York: Catalogue No. 8. This, their fall supplement, illustrates, with prices, Fire Shovels, Pokers, Stove Pipe, Coal Hods, Traps, Mincing Knives, Scales, Soapstone Griddles, Lanterns, Razor Strops, Weather Strip, Guns, Ammunition, Corn Huskers, Oil Cans, Skates, Sad Irons, Thermometers, Night Latches, Brackets, Sleigh Bells, Meat Choppers, Cross Cut Saws, Wood Saws, &c. The catalogue is not intended to represent the firm's full line, but more especially to call attention to seasonable goods, specialties and lines of goods for which they are New York agents.

WALBRIDGE & Co., Buffalo, N. Y.: Lamps. An 1894-95 catalogue of 58 pages, devoted to these goods, gives illustrations of Metal Table Lamps, Porcelain Table Lamps, Decorated Table Lamps, Banquet Lamps, Piano Lamps, Brass Tables, Brass Library Lamps, Hall Lamps, Cigar Lighters, Brackets, Side Lamps, Lanterns, Street Lamps, Shades, Holders, &c. The assortment covers full lines of the goods

mentioned, showing them in a variety of sizes, styles and patterns, making it a convenient book of reference.

GEORGE SWIFT, Streator, Ill.: Stoves, Stove Repairs and Castings. A catalogue devoted to these goods contains an alphabetically arranged list of Heating and Cook Stoves for which repairs are furnished, also illustrations of Hitching Weights, Bolster Plates, Swage Blocks, Grate Bars, Car Wheels, Columns, Iron Railings, Coal Hole Frames and Covers, Bridge Castings, Mandrels, Hitching Posts, Crestings, Sledges, Sash Weights, &c.

WATERTOWN BRASS & MFG. COMPANY, Watertown, N. Y.: Plumbers' Supplies, Cast and Stamped Hinges and Special Brass Hardware. An illustrated pamphlet of Hinges, showing a variety of styles and sizes for refrigerators, water closet seats, &c. The company also make Yacht, Boat and Canoe Trimmings and Fittings and Heavy Brass Hardware for steam and sail yachts.

WHITMAN & BARNES MFG. COMPANY, 111 Chambers street, New York, are now installing their Columbian Exposition exhibit in their New York store. From Chicago it was sent to the Midwinter Fair held in San Francisco after the close of the World's Fair. Among the lines shown, made at the numerous factories of this company, are: Twist Drills and Milling Cutters, Drop Forgings, Wrenches, Mowing Machine Sections, Guards and Knives, Thresher Teeth, &c.

FARWELL, OZMUN, KIRK & Co., St. Paul, Minn.: Fall and winter goods. A catalogue of 88 pages illustrates, with list prices, a large and varied line of goods suitable for the coming seasons. On the front cover is an illustration of the company's new building which they will occupy January 1, 1895. It is 202 feet long by 94 feet deep, six stories high with basement under the entire building, giving a floor space of 133,567 square feet. The building is designed especially for the wholesale Hardware business and will contain every modern improvement that can facilitate the prompt handling of orders.

THE LEACH ROASTER & BAKER COMPANY, Paxton, Ill., Schmitz & Goldfinch, agents, 107 Chambers street, New York: Kitchen and Household Hardware. A catalogue illustrates, with prices, Roasting and Baking Pans, Tea and Coffee Cookers, Broom Support, Lebanon Beaters, Perfection Cake Pans, Egg Poacher, Cistern Strainer, &c.

A. J. HARWI HARDWARE COMPANY, Atchison, Kan.: Seasonable Hardware, fall and winter. A price current illustrates Axes, Wood and Cross Cut Saws, Corn and Hay Knives, Husking Gloves and Pins, Coal Hods, Stove Boards, Hollow Ware, Scales, Meat Cutters, Butcher Knives, Wheelbarrows, Lanterns, Lamps, Oil Heaters, Plated Ware, Sporting Goods, Sleds, &c.

It Is Reported—

California.

That A. S. Gray & Co. of DOWNEY will open a branch store at NORWALK under the style of F. E. Martin & Co. That Wood & Turner, Hardware and Implements, MODESTO, were recently damaged by fire.

Florida.

That C. F. Hamblen's new store at ST. AUGUSTINE is a handsome and commodious structure of excellent arrangement. It is two stories high, with storage room on the roof. The ground floor is 90 by 44 feet, 12 feet high. The floor above is 90 by 40 feet

and 10 feet high. The whole amount of floor space is 25,000 square feet.

That the Hardware store of A. M. Avery, at PENSACOLA, was burglarized on the 28th ult. The thief obtained an entrance to the store by boring holes through the back door and lifting the bar which secured the door.

Illinois.

That J. H. Williams of MAZO MANIE, Wis., has bought out the Hardware business of H. Thompson of CHILLICOTHE and has taken possession.

That D. S. McKnight, at ALEXIS, has sold out.

That the Slocum & Bradley Company, LODA, have been incorporated to carry on the Hardware business of Chas. E. Slocum.

Indiana.

That the Hardware store of C. F. Schulze & Son, OAKTOWN, was robbed on the 19th ult. of Pocket Cutlery, Revolvers, &c., to the amount of \$50.

That John and Otto Delon and Abram Middleton have bought out the Hardware business of Woody & Sims, RUSSELLVILLE.

That A. D. Bryan & Bro., FAIRMONT, have been succeeded by A. D. Bryan.

That John C. Peters & Co., FORT WAYNE, have dissolved partnership.

Iowa.

That the Hardware store of Miguet & Nelson, at HAZELTON, was burglarized on the 26th ult. and \$50 to \$60 worth of Knives, Razors, &c., stolen.

That Ward & Winne have purchased the Hardware stock of Mr. Calkins, at BRADGATE.

That Hayden & Bettler of WAPELLO have taken possession of their new storeroom.

That E. P. Butler has purchased an interest in the Hardware store of I. L. Josselyn, INDIANOLA, and the business will hereafter be conducted under the style of Josselyn & Butler.

That in a large fire at CONRAD on the 6th inst. the Hardware and grocery store of Frazer & Leible was destroyed.

That Frank Potter has disposed of his Hardware business at DUNLAP to L. B. Jackson and John Ashbaugh, who will continue it at the old stand.

That E. L. Townsend, Hardware merchant, of LE MARS, has been succeeded by Dimick Bros.

That Evans & Son, Hardware merchants, LINEVILLE, have been succeeded by Evans & Bro.

That J. H. Gerla, Hardware merchant, of ALTON, has disposed of his business.

That Adams Bros., MANCHESTER, have been succeeded by Huntington & Adams.

That Hanson, Daniels & Co., ODEBOLT, have dissolved.

Kansas.

That Glenn Bros., MANCHESTER, are adding a Hardware department to their business.

That W. H. McGinnis & Co., POWHATTAN, dealers in Hardware and Implements, have disposed of their business.

That Barger & Null, Hardware, SMITH CENTER, have dissolved.

Kentucky.

That the Hardware store of J. H. Mersmann, COVINGTON, was robbed on the 26th ult. of about \$30 worth of goods.

Massachusetts.

That the Hardware store of Rutter & Rideout, on Main street, WALTHAM, was broken into by thieves on the 5th inst., and \$50 worth of Razors, Revolvers, &c., stolen.

That E. D. Wells expects to open his new Hardware store at HOLYOKE in a few days.

Michigan.

That Strong Bros.' Hardware store, at HOMER, was robbed of \$300 worth of goods on the 29th ult.

Minnesota.

That the Hardware and Tinware stock of Charles G. Bryant, at MINNEAPOLIS, was damaged by fire on the 1st inst. to the extent of \$200.

Missouri.

That Dayton Alley and A. A. Alley, Jr., MERCER, have dissolved partnership. The former will continue the Hardware part of the business, while the latter will conduct the dry goods and grocery business.

That Woolfenden & Skewes, NEOSHO, have purchased a double store building in that place, to which they will remove their stock of Hardware.

That Johnson & Son are now carrying on the Hardware business at RIDGEWAY formerly conducted by Witt & Johnson.

That Charles Kraus of WAVERLY has sold his Hardware stock to J. H. Leach.

That W. E. Zahner's Hardware store, at 12 West Tenth street, KANSAS CITY, was damaged about \$200 by fire on the morning of the 2d inst.

Nebraska.

That N. M. Adams, Hardware merchant, of COZAD has sold out.

New Mexico.

That Hardware merchant Frank Howell of SOCORRO has sold out.

New York.

That L. D. Adams of FLORIDA has sold his entire Hardware business to Crawford Bros., who took possession September 1.

North Carolina.

That A. E. Rankin & Co., general store, FAYETTEVILLE, have opened a Hardware department, with R. G. Haigh as manager.

North Dakota.

That Peterson & Jacobson's Hardware store, at MINOT, was destroyed in a large fire in that place on the 3d inst. Loss, \$7000.

Ohio.

That Laughlin & Brown, MCCOMB, are closing out their business with a view to moving to CAREY.

That J. H. Doering & Co., WPAKONETA, have announced their dissolution.

Pennsylvania.

That John Taylor has opened a Hardware store at 403 Market street, CHESTER, having removed from 17 East Fifth street.

South Dakota.

That O. A. Rudolph's Hardware store, at CANTON, was burglarized on the 28th ult. A large quantity of Knives, Revolvers and Razors were carried off by the thieves.

Tennessee.

That A. J. Baker, at SAN ANGELO, has been succeeded by G. Hagelstein.

That D. D. Pafford, Hardware and Furniture, LEXINGTON, has been succeeded by Pafford & Scott.

Texas.

That Thompson, Lowe & Arrington, FORT WORTH, are moving their stock of Hardware from York avenue to North Main street into the building just vacated by L. F. Wright & Co. They will retain their former building, using it as an Iron storage warehouse.

Vermont.

That Geo. Smith of BURKE will soon open a new Hardware store at LYDONVILLE.

Wisconsin.

That August Smith of VIROQUA contemplates commencing the Hardware business at VIOLA in the near future.

The Hardware trade throughout the country are requested to report business changes, improvements and other matters of trade interest suitable for mention in this department.

Paints and Colors.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

White Lead.—The market has not recovered from the effect of the various adverse influences that have had greater or less bearing since the passage of the new tariff. Foreign competition is checked in a certain degree by higher prices asked for Lead in view of the liberal purchases made recently for American account, but some importers keep in the field and offer to sell at prices right in line with those that may prevail for American product. The low price of crude material also has a bearing, since it enables outside manufacturers to successfully compete with the N. L. T. Company and still have a fair margin of profit. Considerable business has been done at the lower range of prices, including contracts for dry White Lead at 4¢ and a slight fraction less and Lead in Oil at 5¼¢, both rates for large lots. Small quantities were sold at corresponding figures.

Red Lead.—The only feature in this line is an advance in European prices that has temporarily checked business in foreign stock for future delivery. Spot stock now brings about 5½¢. American brands are variously quoted between 5¢ and 5½¢ for round lots, but a lower rate than 5¼¢ is the exception. Sales are of about the usual character.

Litharge.—Business has increased somewhat, but not more than it naturally should at this season of the year. The movement was chiefly in the low grades at 4½¢ or thereabout. High grades move in moderate quantities to a fair extent at about the same prices that have ruled for a month or six weeks past.

Orange Mineral.—The market remains in a very unsettled condition, owing to sharp competition between domestic and foreign manufacturers, but the low prices resulting therefrom have stimulated business to some extent. French may be had in round lots at 8½¢, possibly a shade less, German at as low as 6½¢ and American at about the same price.

Zincs.—Little if any change has taken place in the market for American Oxide during the week. Deliveries on contracts have been larger and there is some improvement in orders for future deliveries, but the business is not above the average and prices remain almost stationary. Foreign

of Mixed Paints, but keen competition keeps prices low.

Oils and Turpentine.

Linseed Oil.—The market is suffering from one of the spasms for which it is peculiar and from the old causes. Prices are cut because of sharp outside competition. City crushers do not pretend to ask more than 50¢ for raw Oil by the single cask, and the National Company are free sellers at that or slightly less. Some of the outside concerns have made sales at 48¢, and rumor has it that that rate has been shaded in at least one instance. The cost of raw material continues to be comparatively high.

Cotton Seed Oils.—Export business has been somewhat larger, but home trade purchases are still on a moderate scale and the demand is rather slow. Prices have undergone but little change and are steadier than usual on a quiet market and in the face of new crop uncertainties.

Lard Oil.—City pressers have obtained as high as 68¢ @ 70¢ for prime Oil, but the buying has been light. Consumers regard the present market as unnatural and based only upon the manipulation of lard in Chicago. They therefore prefer to await developments before making anything further than actually necessary purchases. Neatsfoot Oil develops no new features, but the market is a firm one.

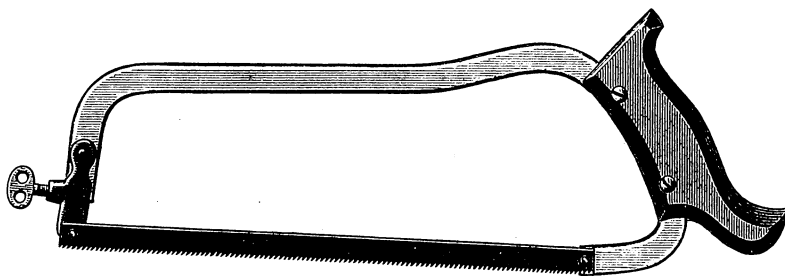
Fish Oils.—Some very fair sales of new crude Menhaden have been made at prices on the basis of 22¢ for prime quality, and the market seems to be gradually getting into better form. Crude Sperm and crude Whale remain very quiet. In the general line of pressed and bleached Oils there is more business, and prices are steadier.

Miscellaneous.—Common Olive Oil in barrels finds slow sale, and between that fact and liberal offerings prices continue rather weak. Sales have been made at as low as 52¢. Coconut Oils are quiet and unchanged. Cod, Neatsfoot and Red Oils are unchanged.

Spirits Turpentine.—There has been quite a lively movement, but prices have undergone little change. Fully 2000 barrels have changed hands for prompt and future delivery. The dealings were chiefly speculative, and the combine still manipulates the market.

Dehorning Saw.

Millers Falls Company, 93 Chambers street, New York, are putting on the market a dehorning saw, as herewith



Dehorning Saw.

brands have fluctuated but little and are selling rather slowly, although advances have been received of probable advance at primary points shortly.

Colors, &c.—Owing to the lower cost of Litharge some reduction in prices of artificial Vermilion has taken place. Otherwise there is no change in Dry Colors, although the general market has a rather soft appearance. Oil Colors are moving rather more freely in a jobbing way, as are most varieties

shown. The frame is rough nicked and has a beech handle. The blades are 10 inches in length, and are not intended to be refilled, but to be discarded when dull. The company state that during the past five years large quantities of their kitchen saws have been used for dehorning purposes; and that considering the increasing demand they have decided to put a dehorning saw upon the market.

Sensible Mincing Knives.

The accompanying cuts relate to improvements in the handles of Sensible



Fig. 1.—Sensible Mincing Knife No. 10.

mincing knives, manufactured by N. R. Streeter & Co., Groton, N. Y.; New York office, W. H. Jacobus, 90



Fig. 2.—Sensible Mincing Knife No. 40.

Chambers street. The new features of the multiple bladed mincing knives are enlarged and bowl shaped handles and

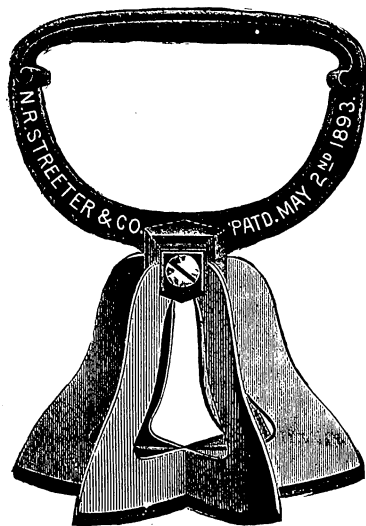


Fig. 3.—Sensible Mincing Knife No. 60.

the mode of fastening the blades. The blades are of tempered steel, nickel plated, and can be removed when they

require sharpening. The company's plan of numbering the knives is such that the first figure indicates the number of blades; thus No. 10 has one blade, No. 20 has two blades, &c. The company remark that the knives are easy to clean.

Eureka Hasp and Lock.

The C. C. Leader Mfg. Company, Shamokin, Pa., are offering the hasp and lock represented in the accompanying cut. It is referred to as a combination of hasp and lock, simple in construction and as not liable to get out of order. It is explained that it does away with the use of a padlock and staple, while it can be used wherever a padlock can be of service. It is further explained that there are many uses for the hasp and lock where a padlock would be unsightly to the eye and cumbersome. The point is made that, unlike a padlock, it cannot be mislaid or carried away. It is recommended by the manufacturers for use on barns, stables, cellar doors, tool chests, butter and egg cases, closet doors, refriger-

and that the action of the balance centers at the hub, making the action of the brake more positive. The brake,

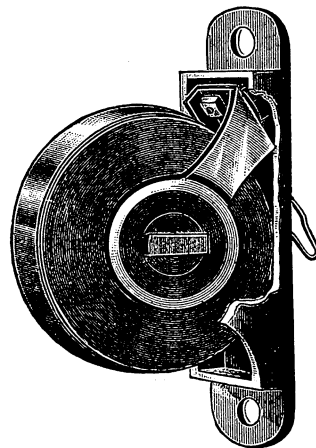
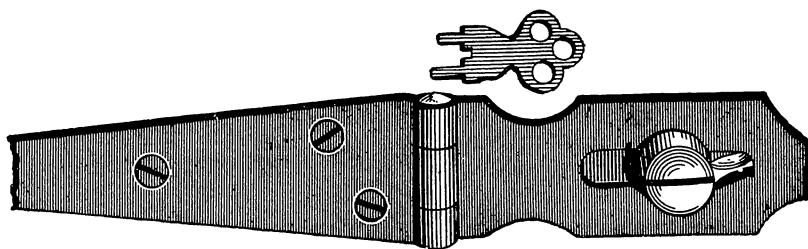


Fig. 2.—Rear View of Sensible Balance.

which is shown in Fig. 2, the frame of the balance being broken away for that purpose, is made of rolled steel working



Eureka Hasp and Lock.

ators, &c. The lock is made of brass and is finished in both nickel plate and japan.

The Sensible Sash Balance.

N. R. Streeter & Co., Groton, N. Y., New York office, W. H. Jacobus, 90 Chambers street, are offering the sash balance herewith shown. The balance has an ornamental face, regularly fin-

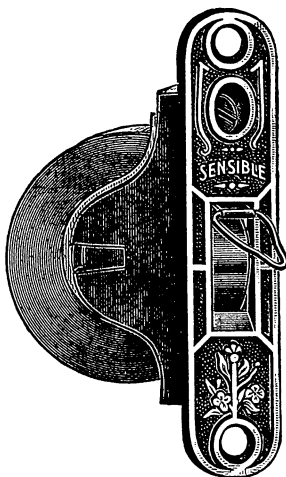


Fig. 1.—The Sensible Sash Balance.

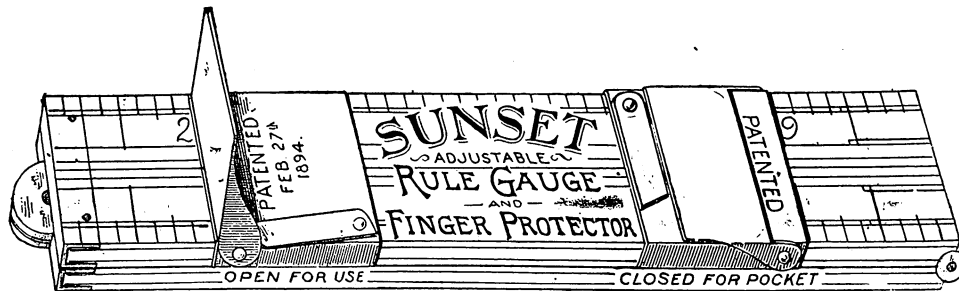
ished in japan of a desirable shade of brown. The metallic ribbon is made of aluminum bronze of the standard gauge. It is explained that the brake not only performs its office perfectly but also acts as a lock for firmly holding together all parts of the balance,

against turned iron. As the screw and nut which hold the brake to the frame are tightened, the brake is pressed more forcibly against the side of the balance, thus allowing the balance to be adjusted to meet a variation of 4 pounds in the weight of sash. It is stated that the brake cannot be tightened sufficiently to buckle the tape, nor will increased tension break any part of the balance. It is remarked that the peculiarity of construction of the balance is such that one size will take care of the variation of 4 or 5 pounds in the weight of a sash, which range is claimed to be peculiar to this balance. For example, it is stated that No. 8-11 balance will operate equally well a sash weighing 8, 9, 10 or 11 pounds, one list price covering the range. It is pointed out that jobbers and dealers will not be required to carry in stock more than one half the number of sizes now needed for assortment to cover the full range of weights of sash, thus saving one-half of the money required for the investment. The manufacturers claim that the balance works smoothly and noiselessly, because the bearings and points of contact are milled, and because there are no surfaces of rough iron working against each other. The balances are made for sash from 4 to 48 pounds, and special finishes in bronze and brass platings are made to order.

During the first seven months of the present year the Belgian blast furnaces produced 521,935 tons of pig iron, which was an increase, as compared with the corresponding period of 1893, of 82,069 tons.

Sunset Rule Gauge.

The cut shown herewith represents the Sunset adjustable rule gauge and finger protector offered by J. J. McManus, 751-753 Market street, San Francisco, Cal. The device is made of brass, of the shape and size shown in



Sunset Rule Gauge.

the cut, and is applicable to any ordinary 2-foot pocket rule, is easily adjusted, and is to be carried on the rule in the pocket when not in use. As a finger protector, when on the rule, it protects the finger from splinters or a rough surface when scribing a line par-

sitions in which the exerciser is used, while in Fig. 2 it is shown in use. The device is described as consisting of a pure gum cable of many strands, covered to protect it from the weather; with adjustable handles and swivel attachments, running over three noiseless

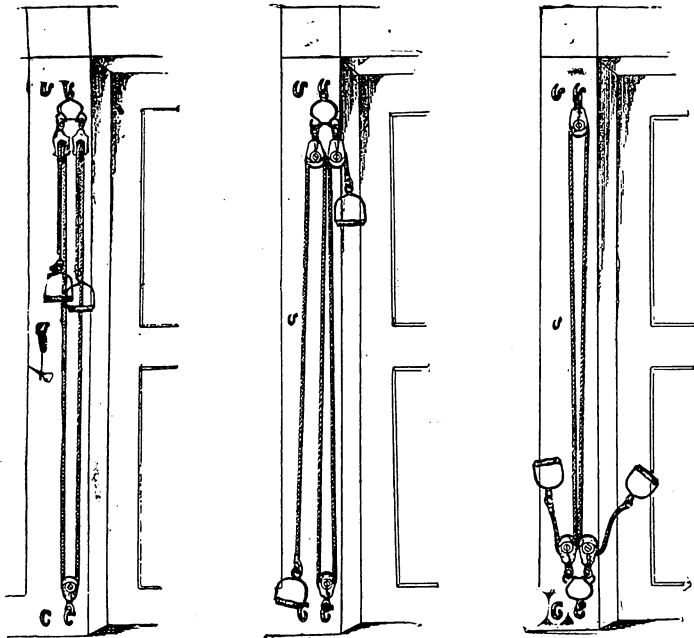


Fig. 1.—The Whitely Exerciser.

allel to the edge. As an adjustable gauge it can be placed at any required position on the rule simply by sliding. It may also be used as a marking gauge, and it is stated that with a pencil or scratch awl all work usually done with a marking gauge, mortise gauge or panel gauge can be performed. It can also be set in an instant as a hinge gauge for marking the cuts on doors and casings in fitting butts or hinges. It is explained that it may be used as a compass or divider by sliding the gauge so that the rivet on either side of the gauge from the end of the rule to the measurement of the radius of the circle gives the center or revolving point, a pencil or awl giving the marking point.

PETER A. FRASSE & Co., 95 Fulton street, New York, importers of and dealers in Watch Makers' Materials and Mechanics' Tools and Supplies, have recently been made the agents for Kidd's Drill Rods, made at Sharpsburg, Pa.

and adjustable cone bearing pulleys, so arranged as to be readily suspended in various positions on small hooks at-

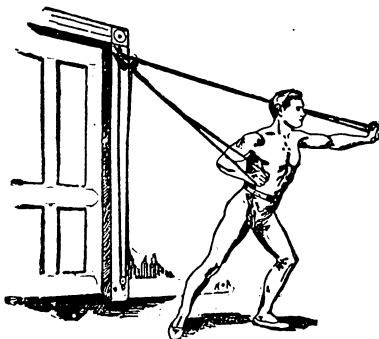


Fig. 2.—Exerciser in Use.

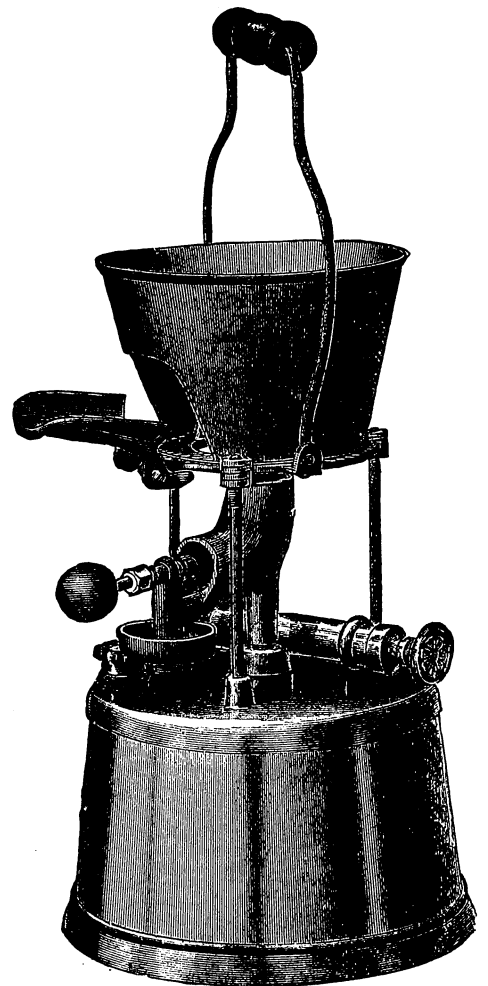
tached to a door jamb, window casing or any other convenient wood work. The manufacturers state that the entire apparatus weighs a trifle more than a

pound, and that it is guaranteed against all defects for two years. It is further stated that the exerciser can be put up in two minutes without the aid of any tools; that it can be removed from the hooks or replaced on them in a moment; that the hooks are of steel wire, strong though small, and do not injure

the wood work; that it is absolutely noiseless, with no straps to buckle or weights to change; that the resistance is self adjusting; that its use is accompanied by no jerks; that it exercises all muscles, not the upper limbs only, and that it makes all movements that can be made on weight machines, without endangering the exerciser.

Hot Blast Plumbers' and Solderers' Furnace.

The illustration herewith given shows a plumbers' and solderers' furnace,



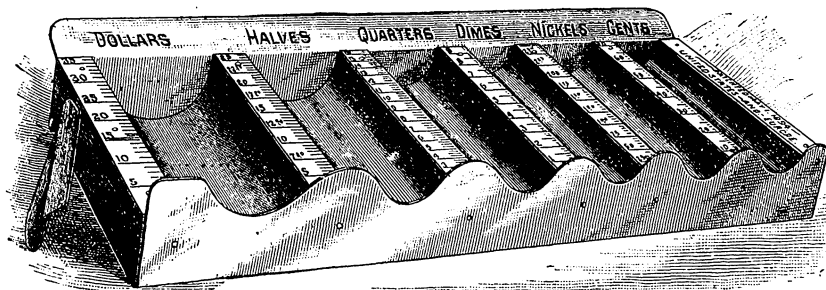
Hot Blast Plumbers' and Solderers' Furnace.

brought out by the White Mfg. Company, 40 and 42 State street, Chicago. It is a gasoline furnace, of unusually

high heating power, intended for melting, heating of soldering coppers, &c. The burner has a powerful generator, which the manufacturers claim will not clog up. The pump is simple and quick acting. The reservoir is spun out of one piece of heavy 14 gauge sheet brass, covered with a cast top and will neither sweat nor leak. It is tested to 50 pounds pressure and will hold 1 gallon, and the furnace will run from 10 to 12 hours, according to the size of the flame used, without refilling. It will run three hours without repumping, and two soldering irons can be heated at the same time. It is fitted with patent renewable needle valve seat, which is also a feature of the Imperial hot blast blow pipe manufactured by the same company. The burner can be renewed for 10 cents, if it should wear out, thus making a practically new torch at very low cost. The blast or heat can be regulated to any desired degree, but it is so strong that the furnace can be used on roofs and other exposed places in the strongest wind without blowing out. The net weight is only 10 pounds.

The Universal Cash Register.

The Universal cash register shown in the accompanying illustration is put on the market by Samuel Chittick, 130 East Twenty-third street, New York. The body of the register is of wood, well finished, about 4 x 9½ inches in size, with nickel plated metallic top and bottom strips. It is also supplied with adjustable legs of different lengths on the ends, to allow of standing it in an inclined position. It is divided into compartments of suitable sizes to accommodate dollars, half dollars, quarters, dimes, nickels and cents, with a marked plate at the left of each compartment to show the amount of coin in the register at any time. The capacity of each compartment is shown in the cut. The manufacturer remarks that the register is useful, simple, convenient, compact and ornamental; that it combines two articles in one, a coin register and a coin holder; that it is a great time and labor saver, avoiding mistakes; that when the cash is in place it is counted and registered in stantaneously, a glance showing the amount; that it acts as a check on those left in charge of the cash while the proprietor is absent; that the registering plates are arranged to count new and



The Universal Cash Register.

worn coin as commercially received and paid out; that it is so adjusted that it can be used in an ordinary cash drawer or placed on a desk, and that when wrapping coins they are already arranged to pick out and wrap up. The maker recommends the register for use in all kinds of business, and delivers it to any point in the United States, charges prepaid, for \$1.

manner keys ordinarily turn in padlocks, the shackle is released from the internal mechanism and springs around at a right angle to the case. To close the lock the shackle is merely pushed around and automatically draws itself into the case and into engagement with the locking mechanism. The price on this lock to the retail trade is about \$2.40 per dozen in quantities.

The Columbia Lifter.

A. C. Williams, Ravenna, Ohio, is offering a lifter as illustrated herewith. The device, as shown in Fig. 1, is designed to remove from ovens pans of beans, puddings, roasts, &c., as shown in Fig. 2, without burning the hands or without the use of cloths. It can also be used for a stove lid lifter. The

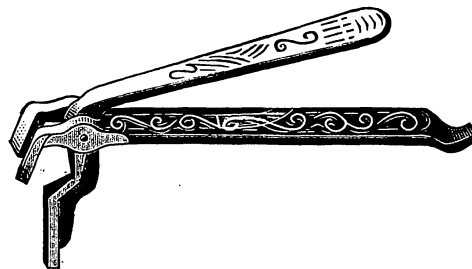


Fig. 1.—The Columbia Lifter.

lifters are furnished japanned, also full nickel plated.

Automatically Opening Shackle Padlock.

The Slaymaker-Barry Company, Lancaster, Pa., are offering an automatically opening padlock, which they describe as being made of all bronze metal, with phosphor bronze springs,

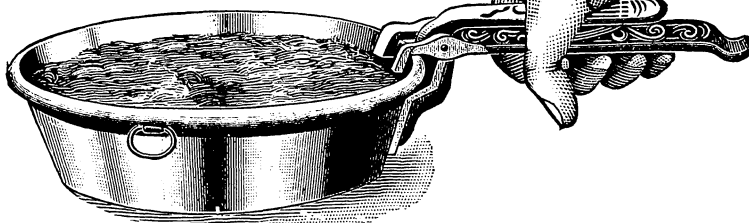


Fig. 2.—Lifter in Use.

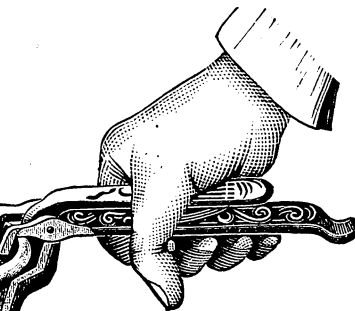
and levers, tumblers and bolts of the best quality of gun metal bronze. The keyhole is protected by revolving bronze metal cylinder bushing. Keys are cut from rolled steel, then milled and nickel plated. The manufacturers explain that upon turning the key, in the

The Merk Christmas Tree Holder.

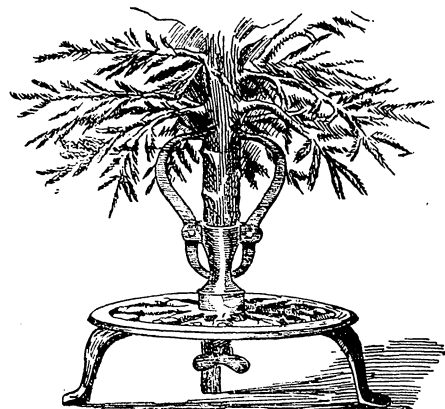
The cut here shown represents a Christmas tree holder offered by the Allentown Hardware Works, Allentown, Pa. The holder is made of iron neatly finished in gold bronze or japan. By an ingenious contrivance the tree is held secure by strong arms which extend upward from the main body of

the receptacle in which it is placed. If desired the tree may be revolved.

At Youngstown, Ohio, last week a meeting of the superintendents of all the railroads entering that city was



held, together with a full representation of the traffic departments. The meeting was called in view of the general resumption of work at the blast furnaces in the Mahoning and Shenango



The Merk Christmas Tree Holder.

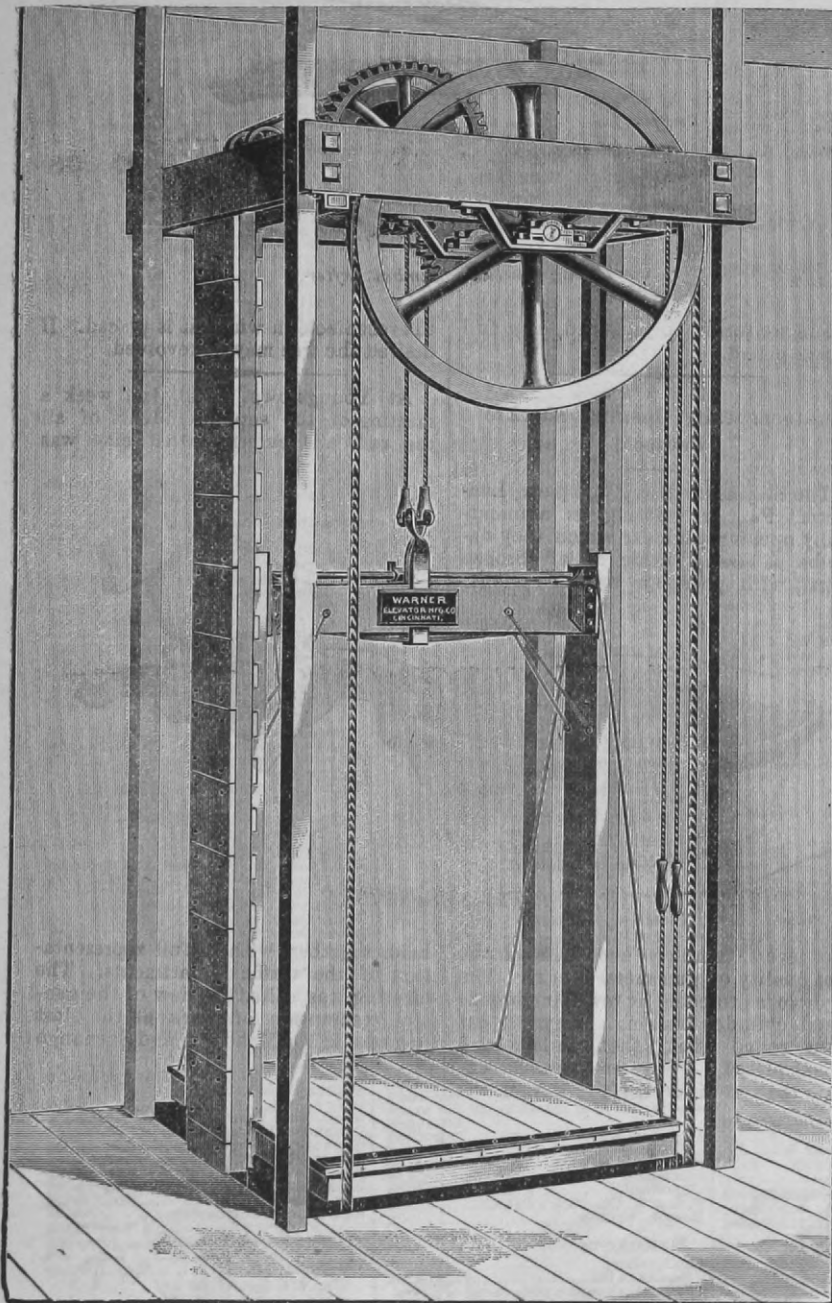
Valleys to discuss the most economical way of doing the switching, inasmuch as all the railroads are jointly interested in this respect. The question of rates did not come up.

Warner's No. 6 Hand Elevator.

The illustration herewith shown represents Warner's No. 6 style hand power safety elevator, manufactured by the Warner Elevator Mfg. Company, Cincinnati, Ohio.

The elevator is described as follows: The platform is made of first quality well seasoned hardwood, the weight of the platform and load being supported by eight wrought iron rods leading from the cross head of same. Four hard-

receive the lifting and counterweight cables. The gearing is supplied with their screw brake, which, it is remarked, enables the operator to hold or control a load with ease at any point. Anti-friction roller bearings are furnished on the machine to greatly reduce the friction and allow the elevator to be operated with a very small amount of power. The guides are not solid posts, but are made in sections to prevent warping and faced with sugar tree, while the weight guides are nicely cased up. The makers claim that the



Warner's No. 6 Hand Elevator.

wood stiles faced with a $\frac{3}{4}$ -inch panel are also used in connecting the cross head beam to platform. A safety catch of the cam pattern, as shown in illustration, is attached to the platform. This device consists of two cams with sharpened edges which work in the two heavy cross head irons on each side of the platform and should the cables break or the platform become obstructed in descent, the cams, it is stated, are forced out, securely locking the platform instantly on the hardwood guide strips. The gearing or overhead machinery is of extra heavy pattern, provided with a cast iron drum chased with grooves to

machine is of special design adapted for any business where a good, strong and easy running hoist is required; that it combines all the features and characteristics that go to constitute a first-class machine; that the parts that compose it are all made from the best material the market affords, while special care is taken in the fitting up and testing of the machines in order to secure the highest possible efficiency. A full drawing is sent with each machine to enable a carpenter or mechanic to put it up without difficulty. The elevators are made in any size or capacity desired.

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Current Hardware Prices.

SEPTEMBER 12, 1894.

NOTE.—The quotations given below represent Current Hardware Prices, whether made by manufacturers or jobbers. They apply to such quantities of goods as are usually purchased by retail Hardware merchants. Very small orders and broken packages often command higher prices.

The character @ is used to indicate a range of price: thus discount 50 & 10% @ 50 & 10 & 5%, signifies that the goods in question are sold at prices ranging from 50 & 10% to 50 & 10 & 5%.

Adjusters, Blind—

Domestic..... \$3.00, 83% @ 83% & 10%
Excelsior..... \$3.00, 83% @ 83% & 10%
North's..... 11% @ 11%
Zimmerman's—See Fasteners Blind.

Ammunition—See Caps, Cartridges, Shells, &c.

Anvils—

American—

Eagle Anvils, \$10 @ 9%..... 15% @ 15%
Horse shoe brand, Wrought..... 11% @ 11%
Moore & Barnes Mfg. Co..... 38% @ 38%

Imported—

Armstrong Mouse Hole..... 8% @ 9%
S. & H., machine finished..... 9% @ 10%
Trenton..... 8% @ 8%
Wilkinson's..... 9% @ 10%
Pet & Wriggins..... 9% @ 10%

Anvil Vise and Drill—

Allen Anvil and Vise \$3.00..... 40% @ 40%
Cheney Anvil and Vise..... 25% @ 25%
Millers Falls Co., \$18.00..... 20% @ 20%
Holt's..... 40% @ 40%

Apple Parers—See Parers Apple, &c.

Augers and Bits—

Boring Machine Augers..... 70% @ 70%
Car Bits, 12 in. twist..... 50% @ 50%
Common Augers and Bits..... 70% @ 70%
Cincinnati Bell-Hangers' Bits..... 80% @ 80%
Forster Pat. Auger Bits..... 25% @ 25%
Jennings' Pattern Car Bits..... 40% @ 40%
Jennings' Pattern Auger Bits..... 60% @ 60%
J. E. Jennings & Co., No. 10, extension..... 40% @ 40%
C. E. Jennings & Co., No. 30..... 60% @ 60%
C. E. Jennings & Co., Auger Bits, set 82% quarters, No. 5, \$5; No. 30, \$3.50, 25%
Russell Jennings' Augers and Bits..... 25% @ 25%
Lewis' Patent Single twist..... 45% @ 45%
L'Hommedieu Car Bits..... 15% @ 15%
Fugh's Black..... 30% @ 30%
Fugh's Jennings Pattern..... 30% @ 30%
Snell's Bits..... 60% @ 60%

Bit Stock Drills—

Cleveland..... 50% @ 50%
Cincinnati, for wood..... 30% @ 30%
Cincinnati, for metal..... 45% @ 45%
Morris Twist Drill Co..... 50% @ 50%
Now Process Twist Drill Co..... 50% @ 50%
Standard..... 50% @ 50%
Syracuse, for metal..... 50% @ 50%
Syracuse, for wood (wood list), 30% @ 30%

Expansive Bits—

Clark's small, \$18; large, \$20..... 40% @ 40%
Ives' No. 4, \$20..... 40% @ 40%
Steer's No. 1, \$20; No. 2, \$18..... 40% @ 40%
Stearns' No. 2, \$43..... 20% @ 20%
Swan's..... 40% @ 40%

Glimlet Bits—

Bee..... 25% @ 25%
Common..... \$2.50 @ 3.00
Diamond..... \$1.25 @ 1.50
Double Cut..... 40% @ 40%
Hartwell's..... \$10.00 @ 10%
Douglass..... 40% @ 40%
Ives..... 60% @ 60%
Shepardson's..... 45% @ 45%

Hollow Augers—

Bonney's Adjustable..... \$3 @ 3%
Cincinnati Adjustable..... 25% @ 25%
Cincinnati Standard..... 25% @ 25%
Douglass..... 35% @ 35%
French, Swift & Co. (Beecher)..... 35% @ 35%

Ives'..... 35% @ 35%
Ives' Expansive, each \$4.50..... 50% @ 50%
Stearns'..... 20% @ 20%
Universal Expansive, each \$4.50..... 20% @ 20%
Wood's, \$4..... 25% @ 25%

Ship Augers and Bits—

L'Hommedieu's..... 15% @ 15%
Snell's..... 25% @ 25%
Snell's Ship Auger Pattn' Car Bits..... 15% @ 15%
Watrous'..... 25% @ 25%

Awl Hafts—See Hafts, Awl.

Awls—

Brad, Handled..... \$2.50 @ 3.00
Brad, Shoulders..... \$1.30 @ 1.50
Peg, Pat..... \$1.30 @ 1.50
Peg, Shoulders..... \$1.50 @ 1.50
Scratch, Handled..... \$1.00 @ 1.50
Scratch, Socket..... \$1.10 @ 1.20

Awl and Tool Sets—See Sets, Awl and Tool.

Axes—

First quality, best brands..... \$6.00 @ \$6.50
First quality, other brands..... 5.50 @ 6.00
Beveled add 50¢ per doz.

Axle Grease—See Grease, Axle.

Axles—

No. 1 Common..... 8% @ 8%
No. 2 Common..... 4% @ 4%
No. 7 to 14..... 7% @ 7%
No. 15 to 22..... 47% @ 47%
No. 19 to 22..... 7% @ 7%
Concord Axles, loose collar..... 4% @ 4%
Concord Axles, solid collar..... 6% @ 6%
Tubular Axles..... 50%

Bag Holders—See Holders, Bag.

Balances—

Sash—

Caldwell, low list..... 30% @ 30%
Pullman..... 40% @ 40%
Sensible..... 60% @ 60%

Spring—

Spring Balances..... 40% @ 50%
No. 200..... 20% @ 20%
Chatillon, \$20..... 17% net
Chatillon Straight Balances..... 40% @ 40%
Chatillon Circular Balances..... 50% @ 50%

Barb Wire—See Wire, Barb.

Bars—

Crow—

Cast Steel..... \$2 @ 2%
Iron, Steel Points..... \$2 @ 2%

Basins, Wash—

Standard Fiberglass, No. 1, 10% in., \$1.80;
12-inch, \$2.00; 13% inch, \$2.50.

Beams Scale—

Scale Beams, List Jan. 12, '83..... 50% @ 50%
Chatillon's No. 1..... 40% @ 40%
Chatillon's No. 2..... 50% @ 50%
Custers'..... 35% @ 35%

Beaters—

Egg—

Bryant's..... \$14.00 gross
Double (H. & R. Mfg. Co.), \$12.00; No. 1, \$16.00; No. 2, \$18.00
Dover..... \$1.00 @ 1.20
Dover (Standard Co.)..... \$1.00 @ 1.20
Duplex (Standard Co.)..... \$1.00 @ 1.20
Duplex Extra Heavy (Standard Co.)..... \$1.00 @ 1.20
Easy (H. & R. Mfg. Co.)..... \$12.00 gross
Improved Acme (H. & R. Mfg. Co.)..... \$12.00 gross
Silver & Co..... \$4.50 gross
Spiral..... \$4.25 @ \$4.50
Triple (H. & R. Mfg. Co.)..... \$4.50 @ \$4.50

Culinary—

Keystone, P. D. & Co., Each, No. 1, \$1;
No. 2, \$2..... 20% @ 20%

Bells—

Cow—

Common Wrought..... 60% @ 60%
Kentucky Durham..... 70% @ 70%
Kentucky, Sargent's list..... 70% @ 70%
Kentucky, "Star"..... 20% @ 20%
Texas Star..... 50% @ 50%
Western, Sargent's list..... 70% @ 70%

Door—

Crank, Brooks'..... 50% @ 50%
Crank, Cone's..... 10% @ 10%
Crank, Connel's..... 20% @ 20%
Gong, Abbe's..... 35% @ 35%
Gong, Barton's..... 40% @ 40%
Gong, Yankee..... 45% @ 45%
Lever, R. & E. Mfg. Co.'s..... 50% @ 50%
Lever, Sargent's..... 60% @ 60%
Lever, Taylor's Bronzed or Plated..... net
Lever, Taylor's Japanned..... 25% @ 25%
Pull, Brook's..... 50% @ 50%

Electric—

Bigelow & Dowse..... 20% @ 20%
Wollensak's..... 20% @ 20%

Hand—

Extra Heavy Brass..... 70% @ 70%
Light Brass..... 70% @ 70%
Silver Chime..... 35% @ 35%
White..... 70% @ 70%
Globe Cone's Patent..... 35% @ 35%

Miscellaneous—

Call..... 45% @ 45%
Farm Bells..... \$2 @ 2%
Steel Alloy Church and School Bells..... 60%

Bellows—

Blacksmiths'..... 60% @ 60%
Hand Bellows..... 40% @ 40%
Molders'..... 40% @ 40%

Beltting, Rubber—

Common Standard..... 75% @ 75%
Extra..... 60% @ 60%
Standard..... 70% @ 70%
N. Y. B. & P. Co., Carbon..... 60% @ 60%
N. Y. B. & P. Co., Double Diamond..... 60% @ 60%
N. Y. B. & P. Co., 1846 Para..... 40% @ 40%

Bench Stops—See Stops, Bench

Benders and Upsetters, Tire—

Detroit Perfect Tire Bender 15 & 16 & 17
Green River Tire Benders and Upsetters..... 20%
Stoddard's Lightning Tire Upsetters..... 15%

Bits—

Auger, Glimlet, Bit Stock Drills, &c.,
see Augers and Bits.

Bit Holders—See Holders.

Blind Adjusters—See Adjusters, Blind.

Blind Fasteners—See Fasteners, Blind.

Blind Staples—See Staples, Blind.

Blocks—

Cleveland Block Co., Mal. Iron..... 50% @ 50%
Moore's Novelty, Mal. Iron..... 50% @ 50%
See also Machines Hoisting.

Bolts—

Carriage, Machine, &c.—

Com. list June 10, '84..... 80% @ 80%
Charter Oak, list Oct. 1884..... 80% @ 80%
genuine Eagle, Norway, list Oct. '84..... 80% @ 80%
Eagle, Norway, list Oct. '84..... 80% @ 80%
Phila. pattern, list Oct. 7, '84..... 80% @ 80%
R. B. & W., old list..... 70% @ 70%
Bolt Ends, list Jan. 1, 1890..... 80% @ 80%
Machine, list Jan. 1, 1890..... 80% @ 80%

Door and Shutter—

Cast Iron Barrel Square, &c..... 75% @ 75%
Cast Iron Chain (Sargent's list)..... 75% @ 75%
Cast Iron Shutter Bolts..... 75% @ 75%
Ives' Patent Door Bolts..... 60% @ 60%
Wrought Barrel..... 75% @ 75%
Wrt B. K. Flush Common..... 60% @ 60%

Wrt Shutter Brass Knob..... 60% @ 60%
Wrt Shutter Sargent's list..... 60% @ 60%
Wrt Shutter, all iron, Stanley's..... 60% @ 60%
Wrought Square..... 75% @ 75%
Wrt Sunk Flush, Sargent's list..... 60% @ 60%
Wrt Sunk Flush, Stanley's list..... 60% @ 60%

Stove and Plow—

Plow..... 60% @ 60%
Stove..... 65% @ 65%
R. B. & W., Plow..... 55%

Tire—

Common, list Feb. 28, '83..... 70% @ 70%
American Screw Company..... 80% @ 80%
Norway, Phila., list Oct. 16, '84..... 80% @ 80%
Eagle, Phila., list Oct. 16, '84..... 80% @ 80%
Bay State, list Feb. 28, '83..... 75% @ 75%
Franklin Moore Co..... 80% @ 80%
Eagle, Phila., list Oct. 16, '84..... 80% @ 80%
Eclipse, list Feb. 28, '83..... 75% @ 75%
Port Chester Bolt and Nut Company..... 75% @ 75%
Keystone, Philadel., list Oct. '84..... 80% @ 80%
Norway, Phila., list Oct. '84..... 80% @ 80%
R. B. & W., Philadel., list Oct. 16, '84..... 85%

Borers, Tap—

Common and Ring..... 90% @ 90%
Clark's..... 35% @ 35%
Enterprise Mfg. Co..... 25% @ 25%
Ives' Tap Borers..... 35% @ 35%

Boring Machines—See Machines, Boring.

Bow Pins—See Pins, Bow.

Boxes, Letter—

Tatum's..... 40% @ 40%

Boxes, Wagon—

Per B..... 25% @ 25%

Boxes, Miter.

Spiker's Excelsior, 3 in \$7.50, 4 in \$8.50, 5 in \$13.00, 6 in \$15.00..... 20%

Braces—

NOTE.—Most Braces are sold at net prices.

Barber's..... 50% @ 50%
Bartholomew's..... 50% @ 50%
Armstrong's..... 50% @ 50%
Common Ball, American..... \$1.00 @ \$1.10
Davis Patent..... 50% @ 50%
Fray's Genuine Spofford's..... 50% @ 50%
Fray's Nos. 70 to 120, 81 to 123, 207 to 414..... 50% @ 50%

Ives' New Haven Novelty..... 50% @ 50%
New Haven Ratchet..... 60% @ 60%
Barber Ratchet..... 60% @ 60%
Barber's..... 60% @ 60%
Spofford..... 60% @ 60%
P. S. & W. Co., Peck's Patent..... 60% @ 60%
Rose & Johnson..... 50%

Brackets—

Shelf, fancy..... 70% @ 70%
Sargent's list..... 70% @ 70%
Other makes at a wide range of prices.

Shelf, plain..... 65% @ 65%
Sargent's list..... 60% @ 60%
Bradley Shelf Brackets..... 70% @ 70%

Bright Wire Goods—See Wire.

Broilers—

Hen's Self, 1 inch..... 9 10 9 11
Basting..... \$4.50 5.50 6.50
Morgan Odorless..... \$12.50
New Haven..... 50% @ 50%
Queen City..... 35% @ 35%
Wire Goods Co..... 65% @ 65%

Buckets, Well and Fire—

See Pails.

Bull Rings—See Rings, Bull.

Butcher's Cleavers—See Cleavers, Butchers.

Butts—

Cast Brass, Fast..... 85% @ 85%
Cast Brass, Loose..... 35% @ 35%
Cast Brass, Tiebout's..... 50% @ 50%
Wrought Brass..... 80% @ 80%

Cast Iron—

Fast Joint, Broad..... 60% @ 60%
Fast Joint, Narrow..... 60% @ 60%

Loose Joint.....

Loose Joint, Japanned..... 75% @ 75%

Loose Joint, Jap. with Acorns..... 80% @ 80%

Loose Pin, Acorns, Japanned..... 75% @ 75%

Loose Pin, Acorns, Japanned..... 75% @ 75%

Plated Tips..... 75% @ 75%

Mayer's Hinges..... 75% @ 75%

Parliament Butts..... 75% @ 75%

Wrought Steel—

Fast Joint, Broad..... 75% @ 75%

Fast Joint, Narrow..... 75% @ 75%

Inside Blind, Light..... 75% @ 75%

Inside Blind, Regular..... 75% @ 75%

Loose Joint, Broad..... 75% @ 75%

Loose Pin..... 75% @ 75%

Table Butts, Back Flaps, &c..... 75% @ 75%

Ransed Wrought Butts..... 75% @ 75%

Cages, Bird—

Hendryx Brass..... 10% @ 10%
3000, 5000, 1100 series..... 10% @ 10%
200 series..... 40% @ 40%
200, 300, 600 and 900 series..... 40% @ 40%
Hendryx Bronze..... 40% @ 40%
700, 800 series..... 40% @ 40%
Hendryx Enamelled..... 40% @ 40%

Calipers—See Compasses.

Calks Toe—

Burke's, One Prong, Blunt..... 45% @ 45%
Burke's, One Prong, Sharp..... 45% @ 45%
Burke's, Two Prong, Blunt..... 45% @ 45%
Burke's Two Prong, Sharp..... 45% @ 45%
Gautier, One Prong, Blunt..... 45% @ 45%

Can Openers—See Openers, Can.

Cans Milk—

S. & Co., 8-gal., \$3.00; 5-gal., \$2.40;
10-gal., \$4.75 each..... 40% @ 40%

Cans Oil—

Galvanized Blue Band, 1 gal., \$1.00, \$1.25
Galvanized Blue Band, 5 gal., Tip-Top..... \$1.00, \$1.25
Galvanized Blue Band, 5 gal., Faucet..... \$1.00, \$1.25
Glass Oil, Friend..... \$1.00, \$1.25

Caps Percussion—

Hick & Goldsmith's and Union Metallic Cartridge Co..... \$1.00 @ 1.00
Eley's E. B..... 50% @ 50%
Eley's D Waterproof, Central Fire, \$1.00
E. B. Grund, Edge, Cent. Fire, 1-10's 47% @ 47%
E. B. Trimmied Edge, 1-10's..... 47% @ 47%
E. D. Waterproof, 1-10's..... 27% @ 27%
G. D. Waterproof, 1-10's..... 27% @ 27%
Musket Waterproof, 1-10's..... 27% @ 27%
S. B. Genuine Imported..... 45% @ 45%

Primers—

Berdan Primers, \$1.00..... 25% @ 25%
B. L. Caps (Sturtevant Shells) \$1.00..... 25% @ 25%
All other Primers, \$1.20..... 25% @ 25%

Cards—

Watson's Cotton, Wool, Horse and File, list January 23, 1891..... 25% @ 25%

Carpet Stretchers—

See Stretchers, Carpet.

Cartridges—

B. B. Caps, Col. Ball, Swad., \$1.85 @ \$1.90
B. B. Caps, Round Ball..... \$1.00 @ 1.00
Black Cartridges, except 22 and 32 cal.,
additional 10% to above discounts.

Blank Cartridges, 22 cal., \$1.75..... 25% @ 25%
Blank Cartridges, 32 cal., \$3.50..... 25% @ 25%
Cent. Fire, Military and Sporting 15% @ 15%
Cent. Fire, Pistol and Rifle..... 25% @ 25%
Primed Shells and Bullets..... 15% @ 15%
Rim Fire Cartridges..... 50% @ 50%
Rim Fire Military..... 15% @ 15%

Carpet Sweepers—

See Sweepers, Carpet.

Chalk Lines—See Lines.**Checks, Door—**

Barley's 20%
 Unity 50%

Chisels—

Socket Framing and Firmer
 Mix 75% to 80%

Ohio Tool Co.
 P. S. & W.
 Witherby 30%

Buck Bros. 30%
 Charles Buck 30%

Douglas 75% to 80%
 Merrill 30% to 40% to 50%

L. & J. White 30% to 40% to 50%

Tanged and Miscellaneous 30%

Buck Bros. 30%

Charles Buck 30%

Butcher 30%

Bear & Jackson 30%

Tanged Firmers 30%

L. & J. White, Tanged 30%

Cold Chisels, fair quality, P. S. 14% to 16%

Chucks—

Beach Pat. each, \$8.00, 20%

Danbury each, \$6.00, 30% to 40%

Graham Patent 30% to 40% to 50%

Morse's Adjustable, each, \$7.00, 30% to 40%

Syracuse, Sals Pat. 25%

Miner Patent Chucks 40%

Combination Lathe Chucks 40%

Drill Chucks 25%

Independent Lathe Chucks 40%

Planer Chucks 40%

Universal Lathe Chucks 40%

Union Mfg. Co. 40%

Combination 40%

Independent 40%

Universal 40%

Victor \$8.50, 35%

Churns—

McDonald's Star Barrel Churn, each

6 gal., \$2.60; 10 gal., \$2.75; 15 gal.,

\$3.00; 20 gal., \$3.25

Tiffin Union, each, 5 gal., \$3.25; 7 gal.,

\$3.75; 10 gal., \$4.25

Clamps—

Adjustable, Cincinnati 15% to 20%

Adjustable, Cincinnati 15% to 20%

Adjustable, Cincinnati 15% to 20%

Barner's Machinists' Clamps 30% to 40%

Cabinet, Sargent's 70% to 80%

Carpenter's, Cincinnati 25% to 30%

Carriage Makers', P. S. & W. Co. 40% to 50%

Carriage Makers', Sargent's 75% to 85%

Eberhard Mfg. Co. 40% to 50%

Joiners' Clamps, Tatum's 25% to 30%

L. & J. White, Wrought Iron 25%

Saw Clamps, see Vises, Saw Filers'

Stearns' Malleable, with Wrought Iron

Screw 75% to 85%

Stearns' Steel 25%

Warner's 40% to 50% to 60%

Cleavers, Butcher—

Beatty's 40% to 50% to 60%

Bradley's 25% to 30%

Foster Bros. 30%

New Haven Edge Tool Co.'s 40%

Nichols Bros. 30%

P. S. & W. 35% to 40% to 45%

Schulte, Lohoff & Co. 40% to 50%

L. & J. White 25%

Clips—

Baker Axle Clips 25% to 30%

Norway, Axle 60% to 70%

Norway Spring Bar Clips 65% to 75%

2d grade Norway Axle 70%

Steel Felloe Clips P. S. & W. 40%

Superior Axle Clips 70%

Wrought Iron Felloe Clips 70%

Cloth and Netting, Wire

See Wire, &c.

Cockeyes—

Hardware List (Globe, Kerosene, Lever

Bibbs, Racking, &c.) 60% to 80% to 100%

Coffee Mills—See Mills, Coffee.

Collars, Dog—

Brass, Pope & Stevens' List 30% to 40%

Chapman Mfg. Company, new list 40%

Embossed, Gift, Pope & Stevens' List 30% to 40%

Leather, Pope & Stevens' List 30% to 40%

Medford Fancy Goods Co. 40% to 50%

Combs, Curry—

American Curry Comb Co. 30% to 40%

Fitch's 60% to 70% to 80%

Gibb's Magnetic P. S. & W. 20%

Kohler's Humane P. S. & W. 15%

Kohler's Magic Oscillating P. S. & W. 20%

Rubber, per doz., \$10.00, 25%

Compasses, Dividers &c.

Compass, Callipers, Dividers, 70% to 80%

Bemis & Call Co.'s

Dividers 65%

Callipers, Call's Patent Inside 55%

Callipers, Double 55%

Callipers, Inside or Outside 65%

Callipers, Wing 65%

Compasses 60% to 65%

Starrett's 60%

Combination Dividers 25%

Lock Callipers and Dividers 25%

Spring Callipers and Dividers 25% to 30%

Stevens & Co.'s 25% to 30%

Coolers, Water—

P. S. & Co.: 2-gal., \$3.50; 3-gal., \$4.00;

4-gal., \$4.50; 5-gal., \$5.00 each 60%

Coopers' Tools—

See Tools, Coopers'

Cord—Sash—

Braided, Crown Drab and Fancy, P. S. & W. 55%

Braided, Crown White, P. S. & W. 50%

Cable Laid Italian Sash P. S. & W. 19% to 20%

Common P. S. & W. 30% to 40%

Common Russia Sash P. S. & W. 12% to 14%

Egyptian, India Hemp, Braided 25%

India Cable Laid Sash P. S. & W. 11% to 12%

Massachusetts, White 25% to 30%

Ossawa Mills—

Crown, Solid Braided White, P. S. & W. 22%

Crown, Drab and Fancy P. S. & W. 25%

Braided Giant, Drab and Fancy 30%

Braided, Giant, White P. S. & W. 20%

Patent, good quality P. S. & W. 10% to 11%

Patent Russia Sash P. S. & W. 13% to 14%

Ramson—

Braided, Drab Cotton P. S. & W. 42%

Braided, Italian Hemp P. S. & W. 40%

Braided, Linen P. S. & W. 55%

Braided, White Cotton P. S. & W. 37%

Semper Idem, Braided, White 25%

Silver Lake—

A quality, Drab, 55% 25%

A quality, White, 55% 25%

B quality, Drab, 55% 10%

B quality, White, 55% 30%

Sylvan Spring, Extra Braided, Drab 30%

Sylvan Spring, Extra Braided, White 34%

Tate's Solid Braided—

Economy Drab P. S. & W. 30%

Economy White P. S. & W. 32%

Heracles, Drab P. S. & W. 32%

Heracles, White P. S. & W. 32%

White Cotton Braided, fair, P. S. & W. 32% to 34%

wire Picture—

Braided or Twisted 30% to 40% to 50%

Corkscrews—See Screws, Cork.

Corn Knives and Cutters

See Knives, Corn.

Crackers, Nut—

Aome.

Japanned, P. S. & W. 30%

Nickel Plated, P. S. & W. 30%

Table (H. & B. Mfg. Co.) 40%

Turner & Seymour Mfg. Co. 50%

Cradles—

Grain 50% to 55% to 60%

Crayons—

White Crayons, P. S. & W. 60% to 65%

Cases, 100 gr., \$3.75 to \$4.25, at factory.

D. M. Steward Mfg. Co.

Metal Workers', P. S. & W. 30% to 35%

Edwards', P. S. & W. 30%

Rolling Mill, P. S. & W. 30%

Soapstone Pencils, P. S. & W. 15% to 20%

See also Chalk.

Creamery Pails—See Pails, Creamery.

Crow Bars—See Bars, Crow.

Curry Combs—

See Combs, Curry.

Cutters—Meat—

American 30%

Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 73

Halters—

Covert's Adj. Rope Halters.....	40&25
Covert's Adj. Web Halters.....	35&25
Covert's Hemp Horse and Cattle Tie.....	50&10&25
Covert's Jute Cattle Ties.....	70&10&25
Covert's Jute Horse Ties.....	70&25
Covert's Rope, 1/8 in., Jute.....	70&25
Covert's Rope, 1/4 in., Hemp.....	50&25
Covert's Rope, Jute.....	60&10&10&25
Covert's Saddlery Works Halters.....	38&25
Covert's Saddlery Works Handy Web Halters.....	38&25
Covert's Saddlery Works Horse and Cattle Ties.....	38&25

Hammers—**Handled Hammers—**

Atha Tool Co.....	
Buffalo Hammer Co.....	50&10&60
Humason & Beckley.....	
Verree.....	40&10
Cheney's Chisel.....	40&10
Cheney's Machinist's & Riveting.....	50&25
O. Hammond & Son.....	40&10&50
Magneto Tack, Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.....	1.75 30&10
Maydole's, list Dec. 1, '88.....	25&10&40
Peck, Stow & Wilcox.....	40&40&25
Payette R. Plumb.....	
Artisans' Choice, A. E. Nail.....	40&12&5
Engineers' and B. S. Hand.....	60&5
Machinists' Hammers.....	60&15
Regular Y. & P., A. E. Nail.....	40&12&5
Other Hammers.....	60&5
Sargent's.....	40&10&50
Warner & Noble, new list.....	25&10

Heavy Hammers and Sledges—

3 lb. and under.....	80&80&10
5 lb. D.....	80&80&10
Over 5 lb. D.....	80&80&10
Wilkinson's Smiths.....	10&10&10

Handcuffs and Leg Irons—**See Police Goods.****Handles—****Cross-Cut Saw Handles—**

Alkins.....	40
Champion.....	15
Ely's Perfection.....	dos. \$3.00
Sensible * doz. Pr.....	\$5.00, 50&50&10

Iron, Wrought or Cast—

Barn Door, * doz. \$1.40.....	20&5
Bronze Iron Drop Latches.....	dos. 60
Chest, Sargent's list.....	50&10&50&10&10
Door or Thump.....	
Nos. 1, 2, 3, 4.....	
Per doz.....	\$0.90 1.00 1.08 1.35 1.50

Jap'd Store Door Handles—Nuts, 1/2 doz.....	1.00
Plate, 1/10; no plate, 1/8 doz.....	1.00
Boggin's Latches.....	dos 28&20&30

Wood—

Auger, assorted.....	gr 5.00
Auger, large.....	gr 7.00
Auger, assorted.....	gr 2.75
Bradawl.....	gr \$2.00
Apple Firmer Chisel, large.....	gr 6.00
Hickory Firmer Chisel, large.....	gr 4.50
Hickory Firmer Chisel, large.....	gr 5.00
Socket Firmer Chisel, ass'd.....	gr 3.00
Socket Framing Chisel, ass'd.....	gr 5.00
Chisel, Fibre Head.....	35&5
Hammer, Hatchet, &c.....	40&25
Hoe, Rake, Shovel, &c.....	60&60&25
Pat. Auger, Douglass.....	set \$1.25
Pat. Auger, Ives.....	30&10
Pat. Auger, Swan's.....	set \$1.00
Saw and Plane.....	40&10&50
J. B. Smith & Co.'s Pat. File.....	50

Hangers—

Barn Door, New England.....	70&70&25
Barn Door, old patterns.....	70&70&25
Barry.....	60&10&10
Best Anti-Friction.....	60&10&10
Boss.....	60&10&10
Carrier Steel Anti-Friction.....	50&10
Champion.....	60&10
Chicago Anti-Friction.....	30&10
Climax Anti-Friction.....	50
Cincinnati Nos. 1, 2, 25; 3, 25, 50; 4, 25, 50.....	
Crecent.....	60&60&10
Cronk's Patent, Steel Covered.....	60&10
Duplex (Wood Track).....	60&10&5
Economy, \$6.00.....	50&10
Hamilton Wrought Steel Track.....	55
Interstate.....	50&10&60
Kidder's.....	60&60&10
Lane's New Standard.....	60&60&25
Lane's Parlor.....	40&40&5
Lane's Standard.....	50&25&50&10
Lundy, Steel Parlor.....	40
Magie.....	45&10
Matchless.....	50&10
Moody.....	30&10
Moore's Baggage Car Door.....	38&25
Moore's Elevator.....	38&25
Moore's Railroad.....	50
Nickel, Steel, Nos. 0, 25; 1, 20; 2, 15.....	40&10&50
Orleans Steel.....	55
Paragon Nos. 5, 5 1/2, 7 and 8.....	30&10
Pendulum, Payson's.....	40&40&10
Perfection.....	50&10&50&10&5
Richards.....	30&30&10
Samson Steel Anti-Friction.....	55
Star.....	40&10&40&10&5
Searns' Anti-Friction.....	20&10&10
Searns' Challenge.....	25&10&10
Sterling.....	50&10&60
Terry's Ideal.....	50&10&50&10&5
Terry's Modern.....	50&10&50&10&5
Terry's Shield.....	50&10&60
Terry's Solid.....	50&10&60
Terry's Wrought Single Strap.....	50&10
Victor, No. 1, \$15.00; No. 2, \$16.50; No. 3, \$18.00.....	25
Warner's Pat.....	20&10&10
Wild West.....	45&10
Zenith for Wood Track.....	55

Harness Snaps—See Snaps.**Hatchets—**

American Axe and Tool Co.....	
Blood's.....	
Hunt's.....	
Hurd's.....	40 & 10
Mann's.....	50
Underhill's.....	
O. Hammond & Son.....	
Payette R. Plumb.....	
Collins.....	10
Buffalo Hammer Co.....	
Kelly's.....	
P. S. & W. Co.....	50 & 50
Sargent's & Co.....	210
O. Huylebrot & Co.....	
Ten Eyck Edge Tool Co.....	

Hay and Straw Knives**See Knives.****Hinges—****Blind Hinges—**

Clark's Nos. 1, 3, 5, 1888, Old Pattern.....	75&10&25
Nos. 1 and 3, Tip Pattern.....	75&10&25
No. 50 Buffalo Noiseless.....	40 60
and 65.....	
Buffalo Reversible, Nos. 3, 2, 1, 1/2, 1 and 0.....	70&5
No. 1, Cottage, for wood only.....	80&10
No. 1, Diamond, for wood only.....	80&5
Dixie L. & P., Nos. 3, 2 1/2, 2, 1 1/2, 1, 0, 00, 4 and 5.....	75&5
No. 25, Empire Reversible.....	75&10
Lull & Porter, Nos. 3, 2 1/2, 2, 1 1/2, 1, 0, 00, 4 and 5.....	75&10&25
Mortise Gravity, Nos. 2, 4, 4 1/2, 6, 8, 9 and 10.....	50
Huber.....	50&10
Parker.....	75&10
North's Automatic Blind Fixtures, No. 2, for Wood, \$9.00; No. 3, for Brick, \$11.50.....	10
Reading's Gravity.....	75&10&25
Sargent's Nos. 1, 3, 5, 11, 13, 18.....	75&10&25
Shepard's.....	
Acme, Lull & Porter, Nos. 3, 2 1/2, 2, 1 1/2, 1, 0, 00, 4 and 5.....	75&5
Buffalo Gravity Locking, Nos. 3, 2, 1 and 5.....	38&5
Champion Gravity Locking, No. 75.....	80&10
Clark's or Shepard's 1888, Old Pattern, Nos. 1, 3 and 5.....	75&10&5
Clark's or Shepard's Tip Pattern, Nos. 1, 3 and 5.....	75&10&5
Double Locking, Nos. 20 and 25.....	70&5
Empire, Nos. 101 and 103.....	75&5
Niagara Gravity Locking, Nos. 1, 3 and 5.....	80&5
Noiseless, Nos. 50, 60, 65 and 55.....	75
O. S. Lull & Porter, Nos. 3, 2 1/2, 2, 1 1/2, 1, 0, 00, 4 and 5.....	75&10&25
Pioneer, Nos. 080, 45 and 56.....	75
Steamboat Gravity Locking No. 10.....	80&10

Gate Hinges—

Automatic.....	dos \$12.50, 50
Clark's, Nos. 1, 2, 8.....	60&10&10&10&5
N. E.....	dos \$7.80, 60&60&10
N. E. Reversible.....	dos \$5.60, 60&60&10
N. Y. State.....	dos \$4.90, 60&60&10
Shepard's Nos. 1, 2, 8.....	60&10&10&10&5
Western.....	dos \$4.20, 60&60&10

Spring Hinges—

Acme.....	30
American.....	20
Bardsley's Patent Checking.....	15
Barker's Double Acting.....	15
Bommer's Japanese.....	35
Bommer's All other Kinds.....	30
Buckman's.....	15&20
Champion.....	60
Chicago.....	30
Columbia.....	gross, \$10.00
Crown.....	20
Devoe, No. 1.....	gr \$13.00
Freeport.....	gr \$12.00
Geer's Spring and Blank Butts.....	40
Gem.....	20
Ideal No. 3.....	gross \$8.00
J. G. C. Covered.....	gr \$30.00
Knox.....	gross, \$12.00
New Idea No. 1.....	gross \$10.00
New Idea No. 2.....	gross, \$13.00
New Idea Dbl. Acting.....	45
No. 10 Matchless.....	60
No. 25 Unbreakable.....	60
Oxford.....	20
Reliable.....	gr \$13.00
Royal.....	60
Samson.....	60&60&75
Stearns' Noiseless Floor Hinge.....	set \$5.00, 20&10&30
Surprise.....	gross, \$12.00
Union Mfg. Co.....	25
Union Spring Hinge Co. list.....	
March, 1888.....	20
Wiles, No. 1.....	gr \$16.00, No. 2.....
Wiles, No. 2.....	30

Wrought Iron Hinges—

Corrug'd Strap and T.....	60&10&10
Strap and T. List May 22, 1894.....	
Plate Hinges, 8, 10 & 12 in.....	60&10&10
"Evidence" over 12 in.....	5
Roll'd Blind Hinges, Nos. 32 and 34.....	50&10
Roll'd Blind Hinges, Nos. 32 and 34.....	50&10
Roll'd Plate.....	55&10
Roll'd Raised.....	70&10
Screw Hook and Eye.....	6 in. \$1.00, 8 in. \$1.25, 10 in. \$1.50, 12 in. \$1.75, 14 in. \$2.00, 16 in. \$2.25, 18 in. \$2.50, 20 in. \$2.75, 22 in. \$3.00, 24 in. \$3.25, 26 in. \$3.50, 28 in. \$3.75, 30 in. \$4.00

Hoes—

Scovill and Oval Pattern.....	50&10&60
D. H. Scovill.....	20&30
Grub.....	60&10
Lane's Crescent, Planters' Pattern.....	45&5
Lane's Razor Blade, Scovill Pat.....	30&5

Handled—

Garden, Mortar, &c.....	70&70&25
Magie.....	dos \$4.00
Planters', Cotton, &c.....	70&70&25
Warren Hoe.....	60&60&25

Hog Rings and Rings—**See Rings and Rings—****Holding Apparatus—****See Machines, Holding.****Hollow-Ware—****See Ware, Hollow.****Holders—**

Sensible Bag and Twine.....	50
Spangle's Pat.....	dos \$18.00, 60
Angular.....	dos \$24.00, 40&25
Diagonal.....	dos \$24.00, 40
Barber's.....	dos \$15.00, 40&40&10
Ives.....	dos \$20.00, 60&50&60&10

File and Tool—

Bals Pat.....	dos \$4.00, 25
Nicholson File Holders.....	20
Sash.....	dos \$1.30, 40
Motley's Adj. Sash, Medium Size.....	

Hooks—**Cast Iron—**

Bird Cage, Reading.....	60&10&10&70
Bird Cage, Sargent's.....	60&10&10&70
Clothes Line, Sargent's List.....	50&60&10

Celling, Sargent's list.....	50&50&10
Clothes Line, Moore's.....	70
Clothes Line, Reading list.....	60&10&60&10&10
Coat and Hat, Moore's.....	70
Coat and Hat, Reading.....	50&10&50&10&10
Coat and Hat, Sargent's list.....	50&50&10

Hammock, E. C. Stearns & Co., * doz.**Harness, Reading list.....55&10&55&10&10****Wire—**

Atlas, Coat and Hat.....	85
Atlas.....	80&15&80&20
Handy Hat and Coat.....	50&10&60
Indestructible Coat and Hat.....	45&45&5
Steady Ceiling Hooks.....	50&10&60
Williamson's Bird Cage Hooks, List April, 1892.....	40
Wire Coat and Hat, Gem, list April, 1890.....	80&80&10
Wire Coat and Hat, Miles, list April, 1890.....	50&50&10
Wire Coat and Hat, Standard.....	60&60&10
Bright Wire Goods—See Wire.	

Wrought Iron—

Cotton Pat. (N. Y. Mailer and Handle) Wks.....	dos \$1.25
Tassel and Picture, T. & S. Mfg. Co.....	50
Wrought Staples Hooks, &c.....	See Wrought Goods

Miscellaneous—

Bush.....	55&60
Fish Hooks, American.....	50
Grook, No. 2, \$2.00; No. 3, \$2.10; No. 4, \$2.25	
Hooks and Eyes—Brass.....	60&10&10
Hooks and Eyes—Malleable Iron.....	70&70&10
Nolin's Grass.....	dos \$2.25
Whiffletree, Patent.....	55
Bench Hooks—See Bench Hooks.	

Horse Nails—See Nails, Horse**Horse Shoes—****See Shoes, Horse.****Hose, Rubber—**

Competition, Fair quality.....	75&75&10
Competition, Low Grade, 1/4 in. ft. 5 1/2	
Extra.....	60&10&60&10&10
Standard.....	70&10&70&10&5
N. Y. B. & P. Co., Carbon.....	70
N. Y. B. & P. Co., Double Diamond.....	50&10&5
N. Y. B. & P. Co., 1846 Para.....	50&10&5
Cotton Garden, 1/4 in., coupled.....	7
Fair Quality, ft.....	7
Good Quality, ft.....	8 1/2

Huskers—

Blair's Adjustable.....	gr \$8.00
Blair's Adjustable Clipper.....	gr 7.00
Hubbard's Solid Steel.....	gr 4.50
"Boss", Styles A and B, \$2.40; E, \$2.10	
* doz., net.....	

Indurated Fiber Ware—**See Ware, Indurated Fiber.****Iron. Curling—**

Nicol's Patent Curling Iron Heater.....	\$1.00
Silver Tipped Grace Darling Curling Iron, * doz.....	\$1.75
No. 65.....	1.50
No. 67, Mustache.....	1.25

Sad—

B. B. Sad Irons, * doz (at factory).....	25&25
Chinese Laundry (N.E. Butt Co.).....	5
Chinese Sad.....	30&30
Crown Improved.....	60&10&10
Ideal Irons, No. 250, * set, 65¢; No. 255.....	60
Mahony's Troy Pol. Irons.....	25
Mrs. Potts' Sad Irons, per set.....	
No. 50.....	65
No. 55.....	60
No. 60.....	70
National Self-Heating.....	54, 20&10
New England.....	54, 20&10
Pottstown, * set, No. 45, 65¢; No. 40, 70¢.....	
Salisbury Irons.....	10
Self-Heating.....	10, 10.00, 20
Self-Heating Tailors' * doz.....	\$22.50, 25
Sensible Sad Irons, per set.....	
Nos. 2.....	30
.....60.....	60
.....65.....	65
Sensible Tailor's Irons.....	33½

Plate.....45¢
 Bomer's Night Latches.....15¢
 R. & E. Mfg. Co., list Mar. 30, 1893.....60¢10¢70¢
 Sargent & Co., list July, 1894.....60¢10¢70¢
 Warner's Burglar Proof.....doz. \$3.00, 50¢

Elevator—

Moore's.....33¢45¢

Padlocks—

Wrought Iron Padlocks:
 Brittain, Graham & Mathes, list Jan. 1, 1894.....75¢
 Mallory, Wheeler Co., list Jan. 1, 1894.....75¢
 Norwich Lock Mfg. Co., list June 10, 1891.....50¢25¢
 Russell & Erwin Mfg. Co., list June 10, 1891.....50¢25¢
 Sargent & Co., list January 1, 1894.....75¢
 William Wilcox Mfg. Co., list January 1, 1894.....75¢20¢
 Ames Sword Co. up to No. 103 incl. 50¢
 Ames Sword Co. above No. 103.....50¢10¢
 Barnes Mfg. Co., list Jan. 1, 1894.....40¢10¢10¢
 Champion Padlocks.....40¢
 A. E. Deltz.....40¢
 Eagle.....40¢
 Eureka, Eagle Lock Co.....40¢25¢
 E. T. Fraim's Keystone Scandinavian.....90¢50¢
 1010 line.....90¢50¢
 120 line.....90¢50¢
 150 line.....60¢
 510 line.....70¢10¢
 235, 610 and 209 lines.....70¢
 All other numbers.....50¢5¢
 Horseshoe.....doz \$9.50 50¢10¢10¢
 Hookless.....30¢
 Bomer's No. 0 to 91.....30¢
 Bomer's Scandinavian, &c., Nos. 100 to 505.....15¢
 Scandinavian.....90¢50¢
 Skymaker, Barry & Co.....90¢
 No. 1010 line.....90¢
 No. 41 line.....60¢
 No. 61 line.....60¢
 No. 21 line.....70¢
 No. 109 line.....90¢40¢
 Star.....60¢
 Yale Lock Mfg. Co.'s.....net prices

Sash, &c.—

Attwell Mfg. Co.....25¢33¢45¢
 Champion Safety list January, 1893.....70¢15¢
 Clark's No. 1, 10; No. 2, 33 gr.....33¢45¢
 Common Sense, Jap'd, Cop'd and Br'd.....gr \$4.00
 Common Sense, Nickel Plated.....gr \$10.00
 Corbin's Daisy, list Feb. 15, 1893.....60¢
 Davis Bronze, Barnes Mfg. Co.....30¢
 Ferguson's.....33¢45¢
 Fish (Liesche's pat.), No. 100, gr.....33¢
 No. 105, gr.....10¢
 Giant, list Jan. 1892.....70¢10¢
 Hammond's Window Springs.....40¢
 Hugin's New Sash Lock.....25¢50¢25¢
 Hugin's Sash Balances.....25¢50¢25¢
 Ives' Patent.....60¢10¢50¢10¢10¢
 Kempshall's Gravity.....60¢
 Kempshall's Model.....60¢10¢10¢
 Payson's Perfect.....60¢10¢10¢
 Reading.....60¢10¢10¢
 Security.....70¢
 Universal.....30¢
 Victor.....60¢10¢25¢
 Walker's.....10¢
 Wolcott's.....60¢10¢25¢

Lumber Tools—

See Tools, Lumber.

Lustro—

Four-ounce bottles.....doz \$1.75; gr gross.....\$17.00

Machines.

Boring—
 Without Augers, Upright, Angular.
 Boss, Carpenters' 3.60
 Boss, Ship Bldrs' 3.85
 Douglas.....\$5.50 \$6.75.....50¢
 Jennings.....5.50 6.75.....50¢50¢25¢
 Mullers Falls.....7.50.....35¢
 Phillips' Patent with Auger.....7.00 7.50.....30¢
 Snell's, Rice's Pat. 5.50 6.75.....40¢10¢10¢

Fluting—

American, 5 in., \$3.00; 6 in., \$3.40; 7 in., \$4.50 each.....35¢
 Combined Fluter and Sad Iron.....doz \$15.00.....80¢
 Crown, 4 1/4 in., \$3.50; 6 in., \$4.00; 8 in., \$5.50 each.....35¢
 Crown Hand Fluter, Nos. 1, \$3.50; 2, \$3.50; 3, \$4.00; 4, \$3.25.....35¢
 Crown Jewel, 6 in.....\$3.50 each 35¢
 Domestic Fluter.....each, \$1.50
 Eagle, 3 1/4-inch Rolls, \$2.15.....35¢
 Eagle, 5 1/4-inch Rolls, \$2.85.....35¢
 Knx, 4 1/4-inch Rolls.....\$3.25 each 35¢
 Knx, 6-inch Rolls.....\$3.60 each 35¢

Holisting—

Moore's Anti-Friction Differential Pulley Block.....20¢
 Moore's Hand Holst, with Lock Brake.....20¢
 Moore's Rope Differential Pulley Block.....60¢
 Marks & Beckley (Teal Patent).....30¢
 See also Blocks.

Washing—

Fair and Square.....doz \$42.00
 Anthony Wayne.....doz \$1.42; No. 3, \$38; No. 3, \$42
 Wayne American.....doz \$36.00
 Wellsell.....doz \$54.00
 Western Star.....doz \$38 No. 3 \$39

Mallets—

B. & L. Block Co., Hickory & L. V. 30¢10¢40¢
 Vibre Head, Stearns.....33¢45¢
 Hickory.....20¢10¢20¢10¢10¢
 Lignumvite.....20¢10¢20¢10¢10¢

Mattocks—Regular list.

60¢10¢60¢10¢5¢

Measures—

Standard Fibreware, No. 1, peak doz. \$2.50; 1/4 peak, \$3.00

Meat Cutters—

Outters, Meat

Menders—

Harness.....doz., \$1.75
 Hudson's Hose Menders, in set, doz., \$6.00
 Hudson's Hose Bands.....gr., \$1.25

Milk Cans—See Cans, Milk.

Coffee—

Box and Side, list Jan. 1, 1888.....60¢10¢
 Net prices are often made which are lower than above discount.
 American, Enterprise Mfg. Co., list Jan. 17, 1893.....20¢
 National List, Jan. 1, 1894.....30¢
 Swift, Lane Bros.....30¢
 Wadell's New Box Mills, Ideal Brand, New List.....50¢10¢10¢

Mining Knives—

See Knives, Mining.

Molasses Gates—

See Gates, Molasses.

Money Drawers—

See Drawers, Money.

Mowers, Lawn—

Highest 10 ft. 12 in. 14 in.
 grade, \$4.00 5.25 \$5.50 6.00 \$5.00 6.75
 Good.....\$3.00 \$3.25 \$3.50
 Cheap.....2.25 2.50 2.75

Muzzles—

Safety.....doz., \$3.00, 25¢

Nails—

Cut and Wire. See Trade Report.
 Wire Nails, Papered.....55¢10¢
 Association list, May 1, '92.....55¢10¢5¢
 Hungarian, Finishing, Upholsters', &c. See Tacks.

Horse—

Nos. 7 8 9 10
 A. C.....25¢ 23¢ 22¢ 21¢ 21¢ 40¢10¢
 American.....9¢ 9¢ 9¢ 9¢ 9¢ net
 Anchor.....23¢ 21¢ 20¢ 19¢ 18¢ 35¢
 Ausable.....23¢ 22¢ 21¢ 20¢ 23¢ 40¢10¢5¢
 Capewell.....19¢ 18¢ 17¢ 16¢ 15¢ 40¢5¢2¢
 C. B. K.....25¢ 23¢ 22¢ 21¢ 21¢ 40¢
 Champion.....25¢ 23¢ 22¢ 21¢ 20¢ 10¢10¢10¢
 Champlain.....25¢ 23¢ 22¢ 21¢ 23¢ 40¢5¢2¢
 Clinton, Fin.....19¢ 17¢ 16¢ 15¢ 14¢ 30¢5¢
 Empire Bronzed.....21¢ 19¢11¢4¢
 Essex.....23¢ 22¢ 21¢ 20¢ 23¢ 40¢10¢50¢
 Lyra.....9¢ 9¢ 9¢ 9¢ 9¢ net
 Maud S.....25¢ 23¢ 22¢ 21¢ 21¢ 50¢10¢5¢
 Northwest'n.....25¢ 23¢ 22¢ 21¢ 20¢ 25¢5¢5¢
 Putnam.....23¢ 21¢ 20¢ 19¢ 18¢ 15¢
 Snowden.....9¢ 9¢ 9¢ 9¢ 9¢ net
 Standard.....23¢ 21¢ 20¢ 19¢ 18¢ 35¢
 Vulcan.....23¢ 21¢ 20¢ 19¢ 18¢ 25¢
 Western.....23¢ 21¢ 20¢ 19¢ 18¢ 50¢

Picture—

Brass Head, Combination list.....50¢10¢
 Brass Head, Sargent's list.....60¢10¢10¢
 Porcelain Head, Combination list.....40¢10¢
 Porcelain Head, Sargent's list.....50¢10¢10¢
 Niles' Patent.....40¢

Nail Pullers—See Pullers, Nail.

Nail Sets—See Sets, Nail

Nippers, See Pliers and Nippers

Nut Crackers—

See Crackers, Nut.

Nuts—List Dec. 13, 1889.

Square, Hex.
 Cold Punched.....5.00¢ 6.10¢ off list
 Hot Pressed.....5.50¢ 6.50¢ off list
 In packages of 100 b. add 1 1/4¢
 net; in packages less than 100 b. add 1/4¢ b. net.

Oakum—

Best or Government.....doz \$4.00 6.00 6.00
 Navy.....doz \$4.00 6.00 6.00
 U. S. Navy.....doz \$4.00 6.00 6.00

Oil Tanks—See Tanks, Oil.

Oilers—

Brass and Copper.....60¢10¢50¢10¢5¢
 Zinc and Tin.....70¢70¢10¢
 Broughton's Brass.....50¢
 Broughton's Zinc.....60¢
 Malleable, Hammers' Improved, No. 1, \$3.60; No. 2, \$4.00; No. 3, \$4.40 doz. 10¢5¢
 Malleable, Hammers' Old Pattern, same list.....50¢
 Olmstead's Brass and Copper.....50¢
 Olmstead's Tin and Zinc.....60¢
 Prior's Pat. or "Paragon" Brass.....60¢
 Prior's Pat. or "Paragon" Zinc.....70¢
 Steel, Draper & Williams.....70¢
 Wilmot & Hobbs Mfg. Co., Steel Anti-Rust.....60¢

Openers, Can—

American.....gr \$1.75 2.00 2.00
 Champion.....doz \$2.00.....50¢
 Domestic.....doz \$2.00.....45¢
 Duplex.....doz 25¢ 15¢20¢
 Eureka.....doz \$2.50 2.50 2.50
 Excelsior, No. 1.....doz \$2.50 2.50 2.50
 French, No. 4.....doz \$2.55 2.55 2.55
 Iron Handle, No. 5.....gr \$6.00 45¢50¢
 Lyman's.....doz \$3.75 20¢
 Messenger's Comet.....doz \$3.00 25¢
 Moore's.....doz \$2.75 30¢
 Sardinia Scissors.....doz \$2.75 30¢
 Sprague, No. 1, 55¢; 2, 60¢; 3, 65¢
 Star.....doz \$2.75 30¢
 Streeter's:
 Sensible, Japanned, per doz.....60¢
 Sensible, Nickel, per doz.....75¢
 Surprise, per doz.....25¢
 New Sprague, Metal, per doz.....50¢
 New Sprague, Wood Handle, per doz.....50¢
 Universal.....doz \$3.00.....55¢55¢
 World's Best gr gross, No. 1, \$12.00; No. 2, \$24.00; No. 3, \$36.00.....50¢10¢

Packing, Steam—

Rubber—
 Standard, fair quality.....70¢10¢75¢
 Inferior quality.....75¢10¢80¢
 Extra.....60¢50¢80¢10¢5¢
 Jenkins' Standard.....doz \$8.00 25¢25¢5¢
 N. Y. B. & P. Co., Double Diamond.....60¢
 N. Y. B. & P. Co., Salamander.....45¢
 N. Y. B. & P. Co., Carbon.....70¢5¢
 Miscellaneous
 American Packing.....9¢10¢10¢
 Cotton Packing.....14¢15¢15¢
 Italian Packing.....12¢13¢13¢
 Jute.....6¢7¢7¢
 Russia Packing.....12¢14¢14¢

Pails—

S. S. & Co.: 13 qt., \$7.00; 20 qt., \$7.25
 doz.....5¢

Galvanized Pails—

Light Heavy
 10 Quart.....\$2.00 \$2.25 \$2.25 \$2.50
 12 Quart.....2.25 2.50 2.50 2.75
 14 Quart.....2.50 2.75 2.75 3.00

Galvanized Buckets—

Well.
 10 Quart.....\$2.50 \$2.75
 12 Quart.....2.75 3.00 \$2.25 \$2.50
 14 Quart.....3.00 3.25 2.50 2.75

Indurated Fiber Ware

Fire Pails, deep.....doz \$4.80
 Fire Pails, round bottom.....doz \$5.40
 Milk, 14 qt.....doz \$5.40
 Stale, 14 qt.....doz \$5.00
 Star Pails, 12 qt.....doz \$4.20

Standard Fiber Ware—

Plain, Deord
 Buggy Pails.....\$3.00
 Chamber Pails, 14 qt.....8.00 \$7.00
 Dairy Pails, 14 qt.....8.75 4.25
 Fire Pails, No. 1, 12 qt.....3.75
 Fire Pails, No. 2, 14 qt.....4.25
 Horse Pails.....4.00
 Slop Jars (bal. trap).....7.50 8.50
 Sugar Pails.....4.75 5.25
 Water Pails, 12 qt., doz. 8.00 8.75

Pans—

Large sizes.....doz \$5
 Small sizes.....doz \$4

Dripping—

Silver & Co. (Covered).....doz \$10

Fry—

Standard List:
 No.....0 1 2 3 4
 doz.....\$3.00 \$3.75 \$4.35 4.75 \$5.25
 No.....0 1 2 3 4
 doz.....\$6.00 \$7.00 \$8.00 \$9.00
 Polished, regular goods.....75¢75¢10¢
 Acme Fry Pans.....60¢45¢

Dust—

Steel Edge, No. 1.....doz \$1.75

Roasting and Baking—

Columbian, S. S. & Co.: Nos. 10, \$2; 20, \$2.50; 30, \$2.50 each.....60¢10¢

Paper and Cloth—

Sand and Emery—
 List April 19, 1886.....50¢10¢60¢
 Sibley's Emery and Crocus Cloth.....30¢

Parers—Apple—

Advance.....doz \$4.25
 Baldwin.....doz 4.75
 Bonanza.....each 5.00
 Daisy.....doz 3.50
 Dandy.....each 7.50
 Eureka, 1888.....each 16.00
 Family Bay State.....doz 12.00
 Favorite.....doz 5.00
 Gold Medal.....doz 4.00
 Ideal.....doz 4.00
 Improved Bay State.....doz \$7.00 30¢40¢
 Little Giant.....doz 4.00
 Monarch.....doz 13.50
 New Lightning.....doz 5.50
 Oriole.....doz 4.00
 Penn.....doz 3.00
 Perfection.....doz 4.00
 Reading 72.....doz 3.75
 Reading 75.....doz 3.75
 Reading Table.....doz 5.50
 Turn Table.....doz 4.50
 Victor.....doz 13.50
 Waverly.....doz 4.00
 White Mountain.....doz 4.00

Potato—

Antrim Combination.....doz \$5.50
 Savage.....doz \$5.50
 White Mountain.....doz \$4.50

Pencils, Soapstone—

See Crayons.

Pickers, Fruit—

Prize Fruit Pickers.....50¢

Picks—

Railroad or Adze Eye, 5 to 6, \$12.00; 6 to 7, \$13.00.....60¢10¢10¢70¢

Picture Nails—

See Nails, Picture.

Pinking Irons—

See Irons, Pinking.

Pins—

Bow—
 Humason, Beckley & Co.'s.....70¢70¢10¢
 Peck, Stow & W. Co.....60¢60¢10¢
 Sargent & Co.'s, \$17 and \$18.....60¢10¢60¢10¢10¢
 Brass.....70¢
 Iron, list Nov. 11, 1885.....75¢

Pipe, Wrought Iron

1 1/4 and under, Plain, list April 13, 1893, 62 1/2¢10¢10¢10¢5¢
 1 1/4 and under, Galv.....60¢10¢10¢10¢5¢
 1 1/2 and over, Plain.....67 1/2¢10¢10¢10¢5¢
 1 1/2 and over, Galv.....67 1/2¢10¢10¢10¢5¢
 Boiler Tubes, list Oct. 24, 1892.....65¢10¢10¢10¢10¢5¢
 Casing, list Nov. 16, 1892.....62 1/2¢10¢10¢10¢5¢
 Cold Drawn Seamless Steel Tubing.....50¢
 Inserted Joints Casing, list Nov. 16, 1892.....47 1/2¢10¢10¢10¢5¢
 Steel Boiler Tubes.....27 1/2¢10¢10¢10¢5¢

Planes and Plane Irons—

Wood Planes—
 Molding.....50¢10¢
 Bench, First quality.....55¢10¢
 Bench, Second quality.....60¢10¢10¢
 Bailey's (Stanley R. & Co.).....50¢10¢
 Iron Planes—
 Bailey's (Stanley R. & L. Co.).....50¢10¢
 Birmingham Plane Co. 60¢10¢60¢10¢10¢
 Chaplin's Iron Planes.....50¢10¢50¢10¢5¢
 Davis' Iron Planes.....50¢50¢5¢
 Gage Tool Co.'s Self-Setting.....35¢
 Miscellaneous Planes (Stanley R. & L. Co.).....25¢10¢
 Sargent's.....60¢10¢10¢10¢
 Standard Tool Co.....50¢10¢10¢10¢10¢
 Stearns' Iron Planes.....50¢10¢50¢10¢5¢
 Plane Irons—
 Auburn Thistle.....30¢10¢30¢10¢10¢
 Buck Bros.....30¢
 Butcher's.....\$5.00 55¢25¢ to 30¢
 Sandusky.....30¢10¢30¢10¢10¢
 Stanley R. & L. Co.....50¢10¢
 L. & J. White.....35¢

Plates—

Felice.....doz \$400

Pliers and Nippers—

Buton's Patent.....60¢
 Carey's Pat. Wire Cutters.....20¢
 Cronk's 8 in., \$15.00; 10 in.....\$20, 60¢
 Cronk's Button Pattern.....60¢10¢5¢
 Cronk's Carrier Pliers.....60¢60¢5¢
 Eureka Pliers and Nippers.....40¢
 Gas Pliers.....60¢
 Gas Pliers, Custer's Nickel Plated.....60¢5¢
 Hall's Nippers, No. 2, 5 in., \$18.50; No. 4, 7 in., \$21.00 doz.....40¢10¢
 Hall's Pliers.....35¢
 Humason & Beckley Mfg. Co. 50¢50¢10¢
 Lindsay's Giant, No. 55, 5 in., doz., \$10.50.....33¢45¢
 Morrill's Parallel, doz., \$12.00.....30¢5¢
 P. S. & W. Cast Steel.....80¢60¢5¢
 P. S. & W. Tinnars' Cutting Nippers, add 6¢.....10¢
 Russell's Parallel.....35¢
 Waterbury Nip's, 5 in., doz., \$7.50, 33¢45¢

Plumbs and Levels

Regular List.....75¢10¢80¢
 Cook's.....40¢10¢
 Davis Inclometers.....10¢10¢
 Davis Iron Levels.....30¢
 Davidson's.....50¢
 Pocket Levels.....70¢10¢70¢10¢10¢
 Stanley's Duplex.....20¢10¢
 Stanley's Handy.....20¢10¢

Poachers, Egg—

Buffalo Steam Egg Poachers, doz. No. 1, \$6.00; No. 2, \$9.00.....35¢45¢
 Silver & Co., 6-Ring, doz., \$4.00, 30¢ Ring.....\$2.00

Pokes Animal—

Bishop's American.....doz \$3.00
 Bishop's I. X. L.....doz \$8.00
 Bishop's Steel Monarch.....doz \$5.00
 Bishop's Ohio.....doz \$8.00
 Bishop's Pioneer.....doz \$3.75
 Bolding.....doz \$5.00
 Buckeye Single Stale.....doz \$5.00
 Columbian Double Stale.....doz \$5.00
 Eagle Double Stale.....doz \$5.00
 Eagle Single Stale.....doz \$3.25
 Metallic Horse Poke.....doz \$5.00

Police Goods—

Daley's Improved Handcuffs, 2 Hands, Polished, doz., \$48.00; Nickle, \$57.00; 3 hands, Polished, doz. \$72.00; Nickle, \$84.00.....25¢
 J. P. Lovell's Police Goods.....25¢
 Newhall Ship Chandlery Co., Handcuffs, \$15.00 doz.....25¢
 Towers.....25¢

Polish—

Metals—
 Gaston's Silver Compound.....33¢45¢
 Prestoline.....50¢
 Prestoline Paste.....55¢45¢
 Tanite Mills
 Paste, 1 lb tins.....gr., \$14.40
 Paste, 1 lb tins.....gr., \$38.00
 Liquid, 1/2 pint.....gr., \$38.00
 Powder, 1 lb.....gr., \$38.00
 Wynn's White Silk, 1/2 pt. cans doz \$1.57

Stove—

Snaps, Harness, &c.—
Anchor 1, S. Mfg. Co. 65¢
Andrews 50¢
Cover's Saddlery Works' Triumph 35¢
Covered Spring 60¢
Covert 50¢
Covert, New Patent 50¢
Covert, New R. E. 50¢
Fitch's (Bristol) 40¢
German, new list 40¢
Hotchkiss 10¢
Kelley & Woolworth's Steel Harness 50¢
John Prots Snaps 75¢
Sargent's Patent 70¢
70¢
70¢
70¢

Snaths—
See *Snaps, Harness, &c.*

Snips, Tinners—See *Shears*.

Soldering Irons—
See *Irons, Soldering*.

Spittoons, Cuspidors, &c.—
Standard Cuspidor 50¢
Cuspidor, 8 1/2 inch, 50¢
Spittoons, 8 1/2 inch, No. 1, 40¢
11 inch, 50¢

Spoke Shaves—
See *Shaves, Spoke*.

Spoke Trimmers—
See *Trimmers, Spoke*.

Spoons and Forks—
Tinned Iron—
Basting, Cen. Stamp Co.'s list 70¢
Buffalo, S. S. & Co. 70¢
Solid Table and Tea, Cen. Stamp Co. 70¢

Stoves—
See *Stoves*.

Strops Razor—
See *Razors, Strops*.

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Strops Razor—
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Oil Stones, &c.—

Pike Mfg. Co. 50¢

Hindustan No. 1, 50¢

Sand Stone 40¢

Turkey Oil Stone, 4 to 8 40¢

In 10¢

Turkey Oil Stone, 4 to 8 40¢

Lily White Washita 40¢

Washita Stone, Extra 40¢

Washita Stone, No. 1 40¢

Washita Stone, No. 2 40¢

Rosy Red Slips 40¢

Washita Slips, Extra 40¢

Washita Slips, No. 1 40¢

Arkansas Stone, No. 1, 3 to 5 40¢

Arkansas Stone, No. 1, 5 to 8 40¢

Lake Superior 40¢

Tanite Mills 40¢

Emery Oil 40¢

Stops, Bench 40¢

Cincinnati 40¢

Hotchkiss 40¢

Morris 40¢

Morris 40¢

Morris 40¢

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Miscellaneous—

Double Point 85¢

Wire Carpet Nails 80¢

Bill Nye Brad Box 40¢

Bonnie Blue 40¢

Claw Handle Carpet 40¢

Home Tacks 50¢

Home Tacks, No. 100, 50¢

Home Tacks, No. 200, 50¢

Home Tacks, No. 400, 50¢

Home Tacks, No. 800, 50¢

Home Tacks, No. 1600, 50¢

Home Tacks, No. 3200, 50¢

Home Tacks, No. 6400, 50¢

Home Tacks, No. 12800, 50¢

Home Tacks, No. 25600, 50¢

Home Tacks, No. 51200, 50¢

Home Tacks, No. 102400, 50¢

Home Tacks, No. 204800, 50¢

Home Tacks, No. 409600, 50¢

Home Tacks, No. 819200, 50¢

Home Tacks, No. 1638400, 50¢

Home Tacks, No. 3276800, 50¢

Home Tacks, No. 6553600, 50¢

Home Tacks, No. 13107200, 50¢

Home Tacks, No. 26214400, 50¢

Home Tacks, No. 52428800, 50¢

Home Tacks, No. 104857600, 50¢

Home Tacks, No. 209715200, 50¢

Home Tacks, No. 419430400, 50¢

Home Tacks, No. 838860800, 50¢

Home Tacks, No. 1677721600, 50¢

Home Tacks, No. 3355443200, 50¢

Home Tacks, No. 6710886400, 50¢

Home Tacks, No. 13421772800, 50¢

Home Tacks, No. 26843545600, 50¢

Home Tacks, No. 53687091200, 50¢

Home Tacks, No. 107374182400, 50¢

Home Tacks, No. 214748364800, 50¢

Home Tacks, No. 429496729600, 50¢

Home Tacks, No. 858993459200, 50¢

Home Tacks, No. 1717986918400, 50¢

Home Tacks, No. 3435973836800, 50¢

Home Tacks, No. 6871947673600, 50¢

Home Tacks, No. 13743895347200, 50¢

Home Tacks, No. 27487790694400, 50¢

Home Tacks, No. 54975581388800, 50¢

Home Tacks, No. 109951162777600, 50¢

Home Tacks, No. 219902325555200, 50¢

Home Tacks, No. 439804651110400, 50¢

Home Tacks, No. 879609302220800, 50¢

Home Tacks, No. 1759218604441600, 50¢

Home Tacks, No. 3518437208883200, 50¢

Home Tacks, No. 7036874417766400, 50¢

Home Tacks, No. 14073748835532800, 50¢

Home Tacks, No. 28147497671065600, 50¢

Home Tacks, No. 56294995342131200, 50¢

Home Tacks, No. 112589990684262400, 50¢

Home Tacks, No. 225179981368524800, 50¢

Home Tacks, No. 450359962737049600, 50¢

Home Tacks, No. 900719925474099200, 50¢

Home Tacks, No. 1801439850948198400, 50¢

Home Tacks, No. 3602879701896396800, 50¢

Home Tacks, No. 7205759403792793600, 50¢

Home Tacks, No. 14411518807585587200, 50¢

Home Tacks, No. 28823037615171174400, 50¢

Home Tacks, No. 57646075230342348800, 50¢

Home Tacks, No. 115292150460684697600, 50¢

Home Tacks, No. 230584300921369395200, 50¢

Home Tacks, No. 461168601842738790400, 50¢

Home Tacks, No. 922337203685477580800, 50¢

Home Tacks, No. 1844674407370955161600, 50¢

Home Tacks, No. 3689348814741910323200, 50¢

Home Tacks, No. 7378697629483820646400, 50¢

CURRENT METAL PRICES.

SEPTEMBER 12, 1894.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from Store—

Common Iron: Duty, 0.6¢	
1 to 2 in. round and square.	1.50¢ @ 1.60¢
2 to 6 in. x 1/2 to 1 in.	
Refined Iron:	
1/2 to 2 in. round and square.	1.60¢ @ 1.80¢
1 to 4 in. x 1/2 to 1 1/2 in.	1.80¢ @ 2.00¢
1/2 to 6 in. x 1/2 to 1 in.	1.70¢ @ 1.90¢
1 to 6 in. x 1/2 and 1 in.	1.80¢ @ 2.00¢
Rods—1/2 and 1-1/2 round and square.	1.70¢ @ 1.90¢
Bands—1 to 6 x 3-16 to No. 12.	1.90¢ @ 2.10¢
"Burden's" Iron base price.	2.80¢
"Burden's" "H. B. & S." Iron base price.	2.60¢
"Uster."	2.00¢
Norway Bars.	3.50 @ 3.75¢
Norway Shapes.	4.00 @ 4.50¢

Merchant Steel from Store—

Open Hearth and Bessemer Machinery, Toe	
Calk, Tire and Sleigh Shoe, base price in	2¢
small lots.	7 1/2¢
Best Cast Steel, base price in small lots.	4 1/2¢
Best Cast Steel Machinery, base price in	
small lots.	

Soft Steel Sheets.

1/2 x 3-16 inch.	2¢
No. 8.	2.10¢
No. 10.	2.10¢
No. 12.	2.20¢
No. 14.	2.30¢
No. 16.	2.40¢
No. 18.	2.50¢
No. 20.	2.60¢
No. 22.	3.10¢

Sheet Iron from Store—

Black.

Nos. 10 to 16.	Common R. G. Cleaned	
Nos. 17 to 21.	American.	2.80¢
Nos. 22 to 24.	American.	2.90¢
Nos. 25 and 26.	American.	3.00¢
Nos. 27.	American.	3.10¢
Nos. 28.	American.	3.20¢
Nos. 29.	American.	3.30¢
Nos. 30.	American.	3.40¢

Russia, Planished, &c.

Genuine Russia, according to assort-	
ment.	11 1/2¢ @ 12 1/2¢
Patent Planished.	10¢ @ 10 1/2¢
Craig Polished Sheet Steel.	8 1/2¢

Galvanized.

Nos. 10 to 16.	B. B.	
Nos. 17 to 21.	B. B.	7 1/2¢ @ 8 1/2¢
Nos. 22 to 24.	B. B.	7 1/2¢ @ 8 1/2¢
Nos. 25 and 26.	B. B.	7 1/2¢ @ 8 1/2¢
Nos. 27.	B. B.	7 1/2¢ @ 8 1/2¢
Nos. 28.	B. B.	7 1/2¢ @ 8 1/2¢
Nos. 29.	B. B.	7 1/2¢ @ 8 1/2¢
Nos. 30.	B. B.	7 1/2¢ @ 8 1/2¢

Foreign Steel from Store—

Best Cast.	15¢
Extra Cast.	16 1/2¢
Swaged, Cast.	16¢
Best Double Shear.	15¢
Blister, 1st quality.	12¢
German Steel, Best.	10¢
2d quality.	9¢
3d quality.	8¢
Sheet Cast Steel, 1st quality.	15¢
2d quality.	14¢
3d quality.	13¢
R. Musket's "Special."	48¢
" " "Annealed.	75¢
" " "Titanic."	20¢
Eicken's Special No. 8.	30¢
" " Extra.	15¢

METALS—

Tin—

Duty.—Pigs, Bars and Block, Free.	Per lb.
Banca, Pigs.	19¢ @ 19 1/2¢
Straits, Pigs.	17¢ @ 17 1/2¢
Straits in Bars.	18¢ @ 18 1/2¢

Tin Plates—

Duty: 1.2¢ per lb.

Charcoal Plates—Bright—

Guaranteed Plates command special prices, according to quality.

Melyn and Calland Grade.	IC, 10 x 14.	\$8.35
" " " " " " " "	IC, 12 x 12.	6.00
" " " " " " " "	IC, 14 x 20.	6.35
" " " " " " " "	IC, 20 x 28.	12.70
" " " " " " " "	IX, 10 x 14.	8.00
" " " " " " " "	IX, 12 x 12.	8.25
" " " " " " " "	IX, 14 x 20.	8.00
" " " " " " " "	IX, 20 x 28.	16.00
" " " " " " " "	DC, 12 1/2 x 17.	6.00
" " " " " " " "	DX, 12 1/2 x 17.	7.50
Ilaway Grade.	IC, 10 x 14.	6.75
" " " " " " " "	IC, 12 x 12.	6.85
" " " " " " " "	IC, 14 x 20.	5.75
" " " " " " " "	IC, 20 x 28.	11.50
" " " " " " " "	IX, 10 x 14.	7.00
" " " " " " " "	IX, 12 x 12.	7.25
" " " " " " " "	IX, 14 x 20.	7.00
" " " " " " " "	IX, 20 x 28.	14.00
" " " " " " " "	DC, 12 1/2 x 17.	5.50
" " " " " " " "	DX, 12 1/2 x 17.	6.50

Coke Plates—Bright—

Steel Coke.—IC, 10 x 14,	14 x 20.....	\$5.35
	10 x 20.....	8.25
	20 x 28.....	11.00
IX, 10 x 14,	14 x 20.....	6.80
IX, 10 x 14,	14 x 20.....	5.40

Charcoal Plates—Terne—

Guaranteed Plates command special prices, according to quality.

Dean Grade.—IC, 14 x 20.....	\$5.40
20 x 28.....	10.80
IX, 14 x 20.....	6.40
20 x 28.....	12.80
Abecarne Grade.—IC, 14 x 20.....	5.25
20 x 28.....	10.50
IX, 14 x 20.....	6.40
20 x 28.....	12.80

Tin Boiler Plates—

IX, 14 x 20.	112 sheets.	\$13.35
IX, 14 x 28.	112 sheets.	14.50
IX, 14 x 31.	112 sheets.	16.00

American Terne Plates.—Apollo.

IC, 14 x 20.	\$5.50
IC, 20 x 28.	11.00
IX, 14 x 20.	6.50
IX, 20 x 28.	12.00

Copper—

Duty: Pig, Bar and Ingot and Old Copper, free. Manufactured (including all articles of which Copper is a component of chief value), 35¢ ad valorem.

Ingot—

Lake.	10 1/2¢
Ansonia grade Arizona.	10¢
Ansonia grade Casting.	9 1/2¢

Sheet and Bolt—

List March 22, 1894. Stub's gauge standard. Net.

	Not wider than	Not longer than	Not longer than	Weights per sq. foot and prices per pound.
				Over 64 oz.
30	72	14	14	14
30	72	14	14	14
36	96	14	14	14
36	96	14	14	14
48	96	14	14	14
48	96	14	14	14
60	96	14	14	14
60	96	14	14	14
84	96	14	14	14
84	96	14	14	14
Over 84 in. wide		17	19	

Bolt Copper, 3/4 inch diameter and over, 14¢. Circles, Segments and Pattern Sheets, 60 in. diameter and less, 3¢ ad valorem over prices of Sheet Copper required to cut them from.

Circles, Segments and Pattern Sheets, over 60 in. diameter, up to 96 in. diameter, inclusive, 4¢ ad valorem over prices of Sheet Copper required to cut them from.

Circles, Segments and Pattern Sheets, over 96 in. diameter, 5¢ ad valorem over prices of Sheet Copper required to cut them from.

Cold or Hard Rolled Copper, 14 oz. square foot and heavier, 1¢ ad valorem over the foregoing prices.

Cold or Hard Rolled Copper, lighter than 14 oz. square foot, 2¢ ad valorem over the foregoing prices.

All Polished Copper over 20 in. wide, 2¢ ad valorem over the foregoing prices.

Copper Bottoms, Pits and Flats—

List March 22, 1894.	Net.	Per lb.
14 ounce to square foot and heavier.		18¢
12 ounce and up to 14 ounce to square foot.		19¢
10 ounce and up to 12 ounce.		21¢
Lighter than 10 ounce.		24¢
Circles less than 8 inches diameter, 2¢ ad val.		
Circles over 13 inches diameter are not classed as		
Copper Bottoms.		

Copper Wash Bowl Bottoms—

Tinned.	34¢, 15¢ @ 25¢
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Tinning—

Tinning sheets on one side, 10, 12 and 14 x 48, each.	6¢
Tinning sheets on one side, 30 x 60, each.	25¢
For tinning boiler sizes, 9 in. (sheets 14 in. x 60 in.), each.	12¢
For tinning boiler sizes, 8 in. (sheets 14 in. x 56 in.), each.	10¢
For tinning boiler sizes, 7 in. (sheets 14 in. x 52 in.), each.	8¢
Tinning sheets on one side, other sizes, square foot.	2¢
For tinning both sides double the above prices.	

Planished Brass and Copper—

16 oz. and heavier.	24¢
14 oz.	25¢
12 oz.	27¢

Seamless Brass Tubes—

Standard always Stub's gauge, unless otherwise ordered. July 12, 1893. Net. Outside Diameter.

O. G.	N. G.	%	%	%	%	1	1 1/2
8-14	6-12	32	28	25	24	23	19
15	13	33	28	26	25	24	20
16	14	34	29	27	26	25	21
17	15	35	30	28	27	26	22
18	16	37	31	29	27	26	22
19	17	38	32	30	29	28	23
20	18	39	34	32	31	30	24
21	20	41	36	34	33	32	25
22	21	43	37	35	34	33	31
23	22	45	39	37	36	35	34
24	23	48	41	39	38	36	36
25	24	51	44	41	40	39	40

Copper Bronze and Gilding Tube, 3¢ ad val. additional. Brazen Brass Tubing. (To No. 19 inclusive.) Brown & Sharpe's gauge standard.

Plain Round Tube.	1/4 in. up to 2 in.	Per lb.
" " " "	1/4	36
" " " "	1/2	38
" " " "	3/4	41
" " " "	1	48
" " " "	1 1/2	1.05
" " " "	2	1.50
Smaller than 1/4 inch.		Special
3 inch and larger.		Special
2 inch to 3 inch, to No. 19 inclusive.		\$0.38
Bronze and Copper, advance on Brass List, 3 cents.		
Discount from list.		40%

Roll and Sheet Brass—

(Brown & Sharpe Standard Gauge.)

Common High Brass:	in.	in.	in.	in.	in.	in.	in.
Wider than	2	10	12	14	16	18	20
and including	10	12	14	16	18	20	22
To No. 20, inclusive.	22	23	25	27	29	31	33
Nos. 21, 22, 23 and 24.	22	24	26	28	30	32	34
Nos. 25 and 26.	23	24 1/2	27	29	31	33	35
Nos. 27 and 28.	23	25	28	30	32	34	36

Common High Brass:	in.	in.	in.	in.	in.	in.	in.
Wider than	24	26	28	30	32	34	36
and including	26	28	30	32	34	36	40
To No. 20, inclusive.	39	42	46	50	55	60	65
Nos. 21, 22, 23 and 24.	40	43	47	51	56	61	68
Nos. 25 and 26.	41	44	48	52	57	62	71
Nos. 27 and 28.	42	45	49	53	58	63	76

* Special price not less than 80 cents. Discount from List 40 %.

Wire in Coils.

List April 9, 1894.

Brown & Sharpe's gauge the standard.	Com. high brass.	Low brass.	Gild'd bronze and copper
All Nos. to No. 10, inclusive.	\$0.23	\$0.27	\$0.31
Above No. 10 to No. 16.	23 1/2¢	27 1/2¢	31 1/2¢
No. 17 and No. 18.	24	28	32
No. 19 and No. 20.	25	29	33
No. 21.	26	30	34
No. 22.	27	31	35
No. 23.	28	32	36
No. 24.	30	34	38
No. 25.	32	36	40
No. 26.	35	39	43
No. 27.	38	42	46
No. 28.	40	44	48
No. 29.	45	49	54
No. 30.	48	52	57
No. 31.	51	55	60
No. 32.	55	59	63
No. 33.	59	63	67
No. 34.	64	68	71
No. 35.	70	74	78
No. 36.	76	80	84
No. 37.	1.00	1.04	1.08
No. 38.	1.30	1.34	1.38
No. 39.	2.00	2.00	2.00
No. 40.	2.60	2.60	2.60

Discount, 40 %. Spring Wire, 2¢ ad val.

Copper Belt and Hose Rivets and Burrs—

Per lb.	Per lb.
No. 5.	48¢
No. 6.	49¢
No. 7.	49¢
No. 8.	50¢
No. 9.	52¢
No. 10.	54¢
No. 11.	56¢
No. 12.	58¢
No. 13.	60¢
No. 14.	65¢
No. 15.	70¢

60 % @ 5 % discount.

Tobin Bronze—Rods.

Drawn Rods for Bolts, Forgings, &c.

1/4 to 3/4 inches inclusive.	17¢
Over 3/4 to 5 inches inclusive.	18¢
Piston Rods, Finished True, Smooth and Straight.	
1/4 to 3/4 inches inclusive.	18¢
Over 3/4 to 5 inches inclusive.	19¢

Spelter—

Duty: In Blocks or Pigs, 1¢ per lb.	
Western Spelter.	44¢
Bertha (pure).	8¢ @ 8 1/2¢

Zinc—

Duty: Sheet, 1.25¢ per lb.	
600 lb casks.	5¢
Per lb.	5 1/2¢

Lead—

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